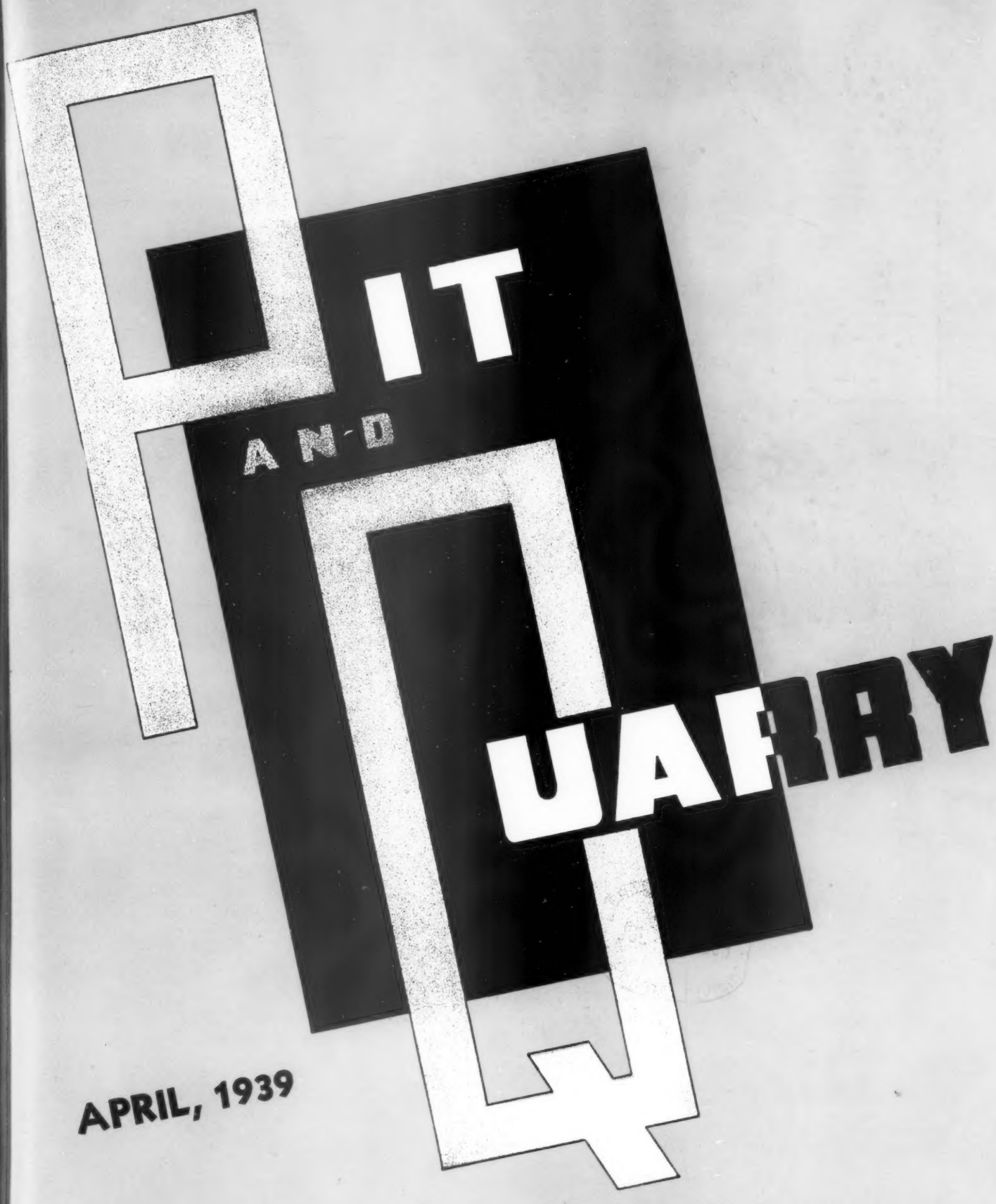


APRIL, 1939

The ASTM and AIMME Meetings . . . Medusa Opens Small Plant for Special Cements
Pyrophyllite Mining Experiences Revival . . . Fourteen Points for Successful Selling

THE "Why" IS IN THE MAKER

Manila Cordage
For practically every field and use, including
Pile Driver
Hoisting
Hammerfall
Transmission
Drilling Cable
Bolt Rope
Shovel Rope
General Contracting
Structural Requirements
Marine
Stevedoring
Dredging
Oil & Water-Well
General Hardware

. . . MANILA CABLE

Drilling Superintendent's Comments: *"The (Wall) ropes furnished us are giving good service and very satisfactory . . . feel that we will get more footage from same."*

Like other practical rope users, you may have wondered why Wall has won distinction as the World's Number One Manila Cable.

If you want the ***inside facts,*** remember that: "The tougher the fibre, the stronger the rope." That is where quality begins . . . scrupulous care in selecting live, vigorous fibres . . . constant control in blending, combing and spinning uniform yarns . . . scientific lubrication for protection against moisture and friction to reduce rot and internal abrasion.

Carefully constructed according to the established specifications WALL MANILA CABLES give drillers maximum service for size and weight with "spring" and "reach" so important for increased footage and speed of penetration.

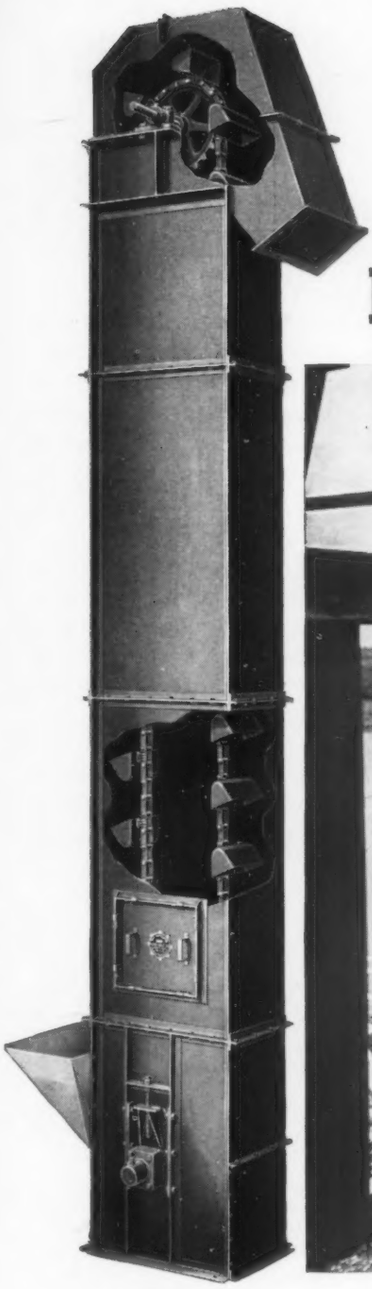
Specify WALL when you order. Sold by leading equipment and supply houses. Further information will be gladly sent upon request.

WALL ROPE WORKS, INC.
48 South Street, New York City—Factory: Beverly, N. J.

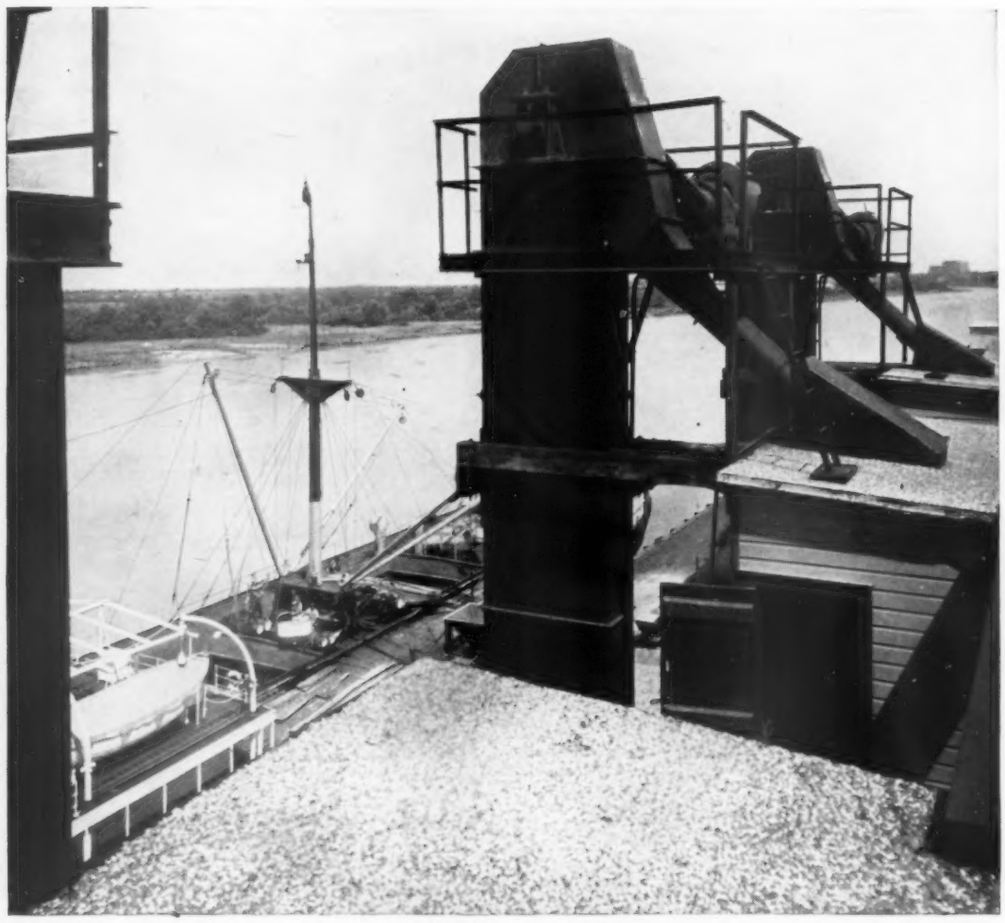
BRANCH OFFICES
Boston, Philadelphia, Chicago, San Francisco, Houston, Tulsa, Baltimore, New Orleans, Norfolk, Pittsburgh

LONGEST ROPEWALK IN THE WORLD

JUN 30 1939



Simple and Easy
MATERIALS HANDLING



Link Belt Bucket Elevators handling Nitrate of Soda into storage warehouse.

LINK-BELT EQUIPMENT INCLUDES:

Complete Sand, Gravel, and Stone Washing Plants . . . Screens (vibrating, rotary and conical) . . . Washers and classifiers, of the screw, log, flight, Shaw and conical types . . . Dewatering Rotoscoops and Screw Conveyors . . . Conveyors and Elevators (belt, flight, screw, bucket, all approved types) . . . Speed-o-Matic Shovels-Draglines . . . Silent and Roller Chain Drives . . . Speed Reducers . . . Variable Speed Transmissions . . . Chains (Malleable Iron, PROMAL and Steel) . . . Sprockets, Buckets . . . Gears . . . Couplings . . . etc. Catalogs on request.

● When your materials handling problem requires the use of a bucket elevator, be sure to investigate the Link-Belt line. It is complete—and includes standardized units of the Centrifugal Discharge . . . Perfect Discharge . . . Continuous Bucket . . . Gravity Discharge . . . and Pivoted Bucket types.

Link-Belt's broad experience in the art of handling materials from where they are to where they are wanted next, is at your service. No order is too large nor too small to merit our painstaking attention.

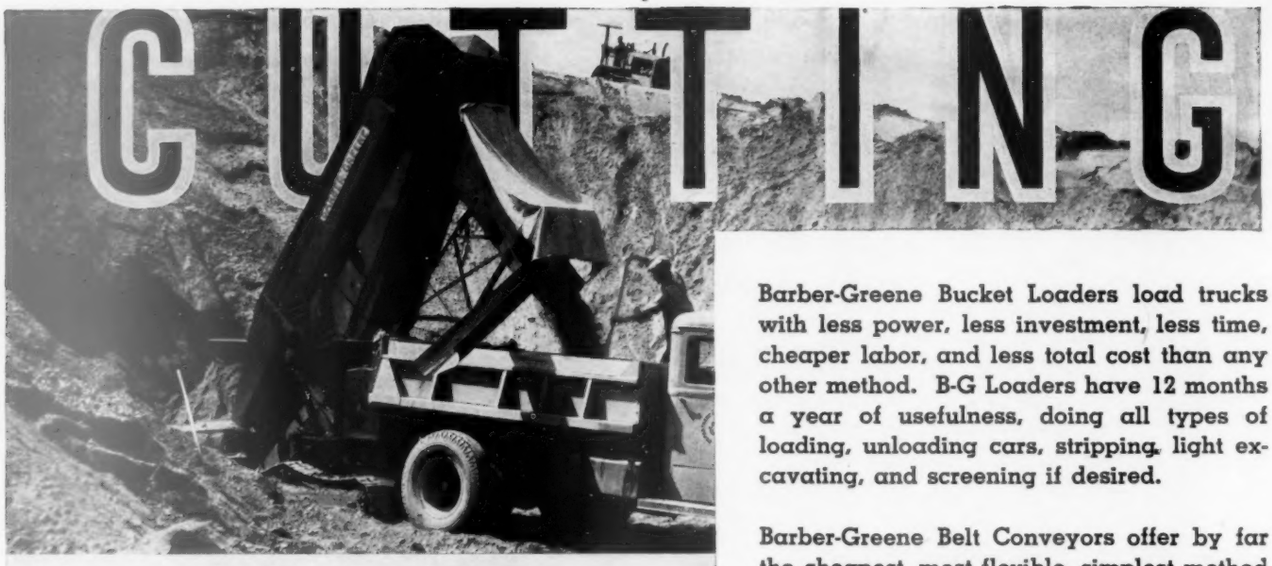
Send for Catalog. Address: Link-Belt Company, Chicago, Philadelphia, Indianapolis, Atlanta, San Francisco, Toronto. Offices in Principal Cities.

7633-A

1939
NEW YORK WORLD'S FAIR EXHIBITOR
METALS BLDG.

LINK-BELT
Conveying and Transmission Equipment

PIT AND QUARRY, April, 1939. Vol. 31, No. 10. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $1 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 20 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the act of March 3, 1897.



The Primary Purpose of All Barber-Greenes

Barber-Greene Bucket Loaders load trucks with less power, less investment, less time, cheaper labor, and less total cost than any other method. B-G Loaders have 12 months a year of usefulness, doing all types of loading, unloading cars, stripping, light excavating, and screening if desired.

Barber-Greene Belt Conveyors offer by far the cheapest, most flexible, simplest method of unloading, stocking, moving bulk materials. Their standardized sectional construction gives unequaled original delivery, erection and change of set-up.

It is these facts that make Barber-Greene pre-eminent in Cost Cutting Material Handling. For full information, phone, wire or write Barber-Greene Company, 492 West Park Avenue, Aurora, Illinois.

38-6

STANDARDIZED MATERIAL HANDLING MACHINES

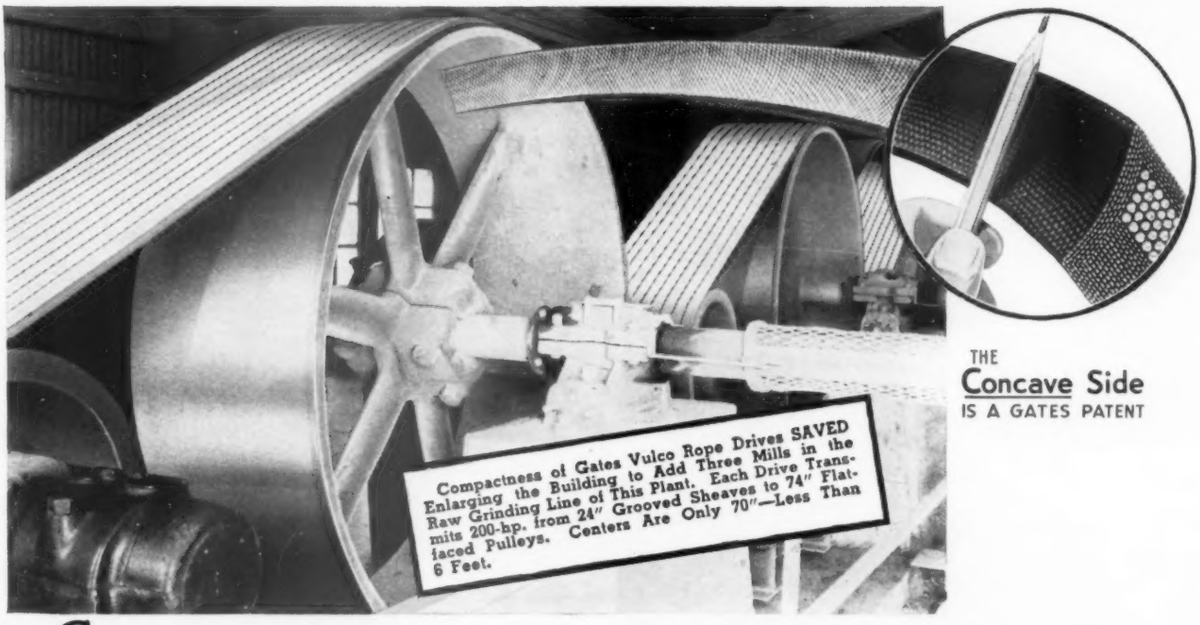
Representatives in Principal Cities

BARBER GREENE

BRANCH OFFICES
Cleveland · Chicago · New York
Columbus · Boston · Detroit · ·
Cable Address · BARGREENE ·

Standardized Belt Conveyors
CARRIERS
Portable CONVEYORS
SNOW LOADERS for high speed removal
Permanent CONVEYORS
and other standardized unit parts
MIXERS for Bituminous or Stabilized Mixing · · · Central or Travel Plant
Leveling-Tamping FINISHERS
LOADERS for lowest cost loading
Vertical Boom DITCHERS
Low Cost-High Quality Road Construction

This Simple Patent
Cuts Your Belt and Power Costs


Compactness of Gates Vulco Rope Drives SAVED Enlarging the Building to Add Three Mills in the Raw Grinding Line of This Plant. Each Drive Transmits 200-hp. from 24" Grooved Sheaves to 74" Flat-faced Pulleys. Centers Are Only 70"—Less Than 6 Feet.

THE **Concave Side** IS A GATES PATENT

GRIP with your fingers the sides of *any* V-belt; then bend the belt and feel the sidewall *change shape*. Being under tension, the top of the belt *narrows*. The bottom, compressed, becomes *wider*. The sidewalls *bulge*. These stresses distort a straight-sided V-belt into a shape that does not fit the sheave groove—as shown in Figure 1, right. Note the out-bulge of the sides.

Now bend a V-belt built with the concave side. You'll feel the same stresses, the same shape change with this *big difference:* the altered shape exactly fits the sheave groove — as shown in figure 2. Two advantages result. (1) No sidewall bulge; therefore uniform sidewall wear; *longer life!* (2) Full sidewall grip on the pulley; therefore less slippage on heavy loads or sudden load increases—a saving in belt wear and also in POWER.

The Gates Vulco Rope is the only V-Belt built with the patented concave side.

What Happens When a V-Belt Bends

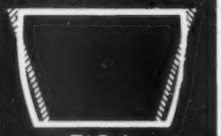


FIG. 1

FIG. 2

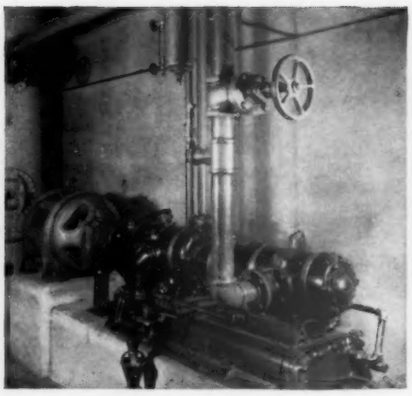
THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

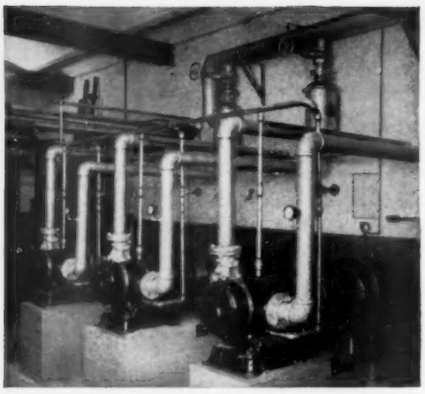
GATES VULCO ROPE DRIVES

CHICAGO, ILL., 1524 South Western Ave. HOBOKEN, N. J., Terminal Building BIRMINGHAM, ALA., 1631 1st Ave., S. LOS ANGELES, CAL., 741 Warehouse St.
DENVER, COLO., 999 South Broadway DALLAS, TEX., 2213 Griffin Street PORTLAND, ORE., 1231 N. W. Hoyt St. SAN FRANCISCO, CAL., 2700 16th St.

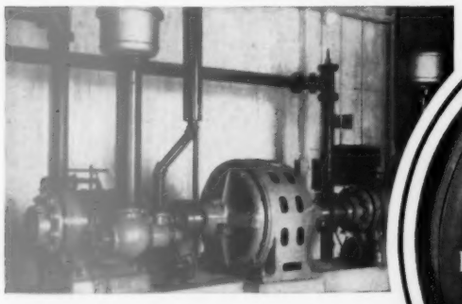
GAS INDUSTRY–Single-stage gas compressor 756 c. f. m. (1,088,640 cu. ft. per day.)



INCINERATOR PLANT–Two-stage compressor, 234 c. f. m. actual free-air delivery, 100 lb. pressure.

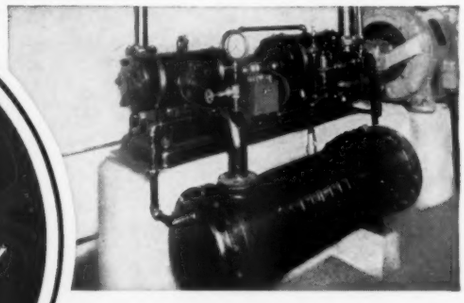


GLASS MFG. PLANT–Single-stage vacuum pumps, capacity each 217 c. f. m. at 26" vacuum.

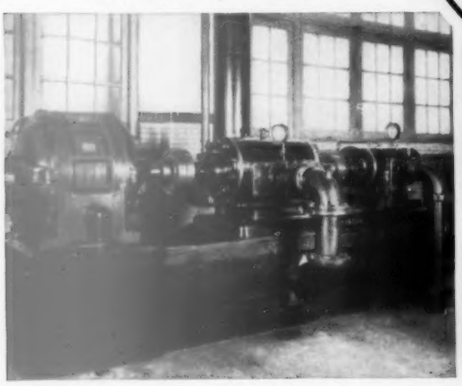


CEMENT PLANT–Single-stage, duplex unit, common motor drive, capacity better than 2000 c. f. m. up to 30 lb.

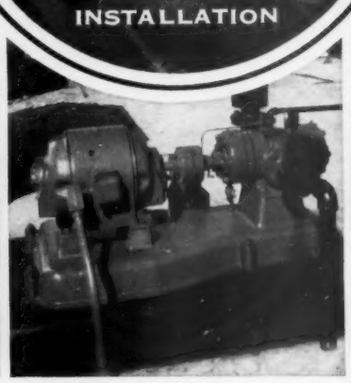
TYPICAL
FULLER
ROTARY COMPRESSOR
AND
VACUUM PUMP
APPLICATIONS
FULLER COMPANY
CATASAUQUA, PA.
YOU TOO CAN PROFIT BY SUCH AN INSTALLATION



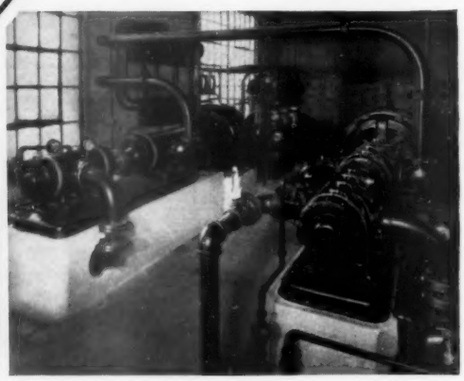
FOUNDRY–Two-stage compressor, 330 c.f.m. actual free air delivery, 100 lb. pressure.



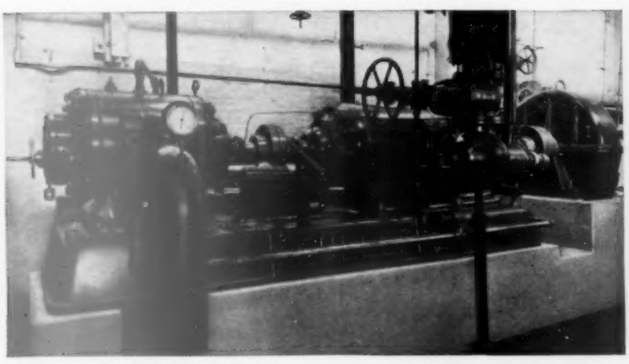
FOOD PRODUCTS–Two-stage compressor, 1000 c. f. m. actual delivery, 100 lb. pressure.



REFINERY–Single-stage compressor, 125 c. f. m., 15 lb. pressure.



CEMENT–Two-stage compressors, capacity 740 c. f. m. each, 100 lb. pressure.



COPPER REFINERY–Two-stage compressor, geared turbine drive, 1775 c. f. m. actual free air delivery at 650 r. p. m., 100 lb. pressure.

SEWAGE DISPOSAL–Two "air-cooled" sewage agitation compressors, each rated 1750 c. f. m., 8.4 lb. average discharge pressure.

C-35

✓ Check this chart and check your losses!

☐ **WASTED MATERIALS**
Dust, when of intrinsic value, represents waste unless it is salvaged

☐ **MACHINERY REPAIRS**
Dust is abrasive, increases wear and tear in machinery

☐ **SHUT-DOWNS**
Dust causes damages which may entail highly expensive stoppages

☐ **HIGH LIGHTING BILLS**
Dust reduces visibility, necessitates higher wattage

☐ **SUB-STANDARD PRODUCTS**
Dust impairs the work of precision machines, affects many operations

☐ **REDUCED WORKING EFFICIENCY** Dust lowers morale, slows up the working pace

☐ **EXTRA CLEAN-UP EXPENSE**
Dust spreads throughout the plant, makes cleaning harder and more frequent

Efficient

DUST CONTROL

Put a stop to the losses that dust causes when it is not efficiently controlled. Halt the daily raid on your profits.

Not all of the elements of loss which are attributable to dust appear in the chart here. And not all of them, perhaps, apply in your case. But by and large, throughout industry, the losses chargeable to uncontrolled dust are huge.

You are sure to effect significant savings for your company by *efficient* dust control. We stress the "efficient" advisedly, for dust collection systems vary widely in performance and in cost.

Write for our *Bulletin D81*. It explains dust collection principles clearly, helps you size up your own needs—and is free to any managing executive or operating engineer.

BUELL ENGINEERING COMPANY INC
Suite 5000, 12 Cedar Street, New York

Buell Dust Collectors are engineered individually to meet the requirements of each specific job. They are the *only* collectors which bring you the combination of high extraction efficiency and low operating costs which the patented Van Tongeren design ensures. Maintenance costs are so slight as to be negligible. Operating costs are practically nil.

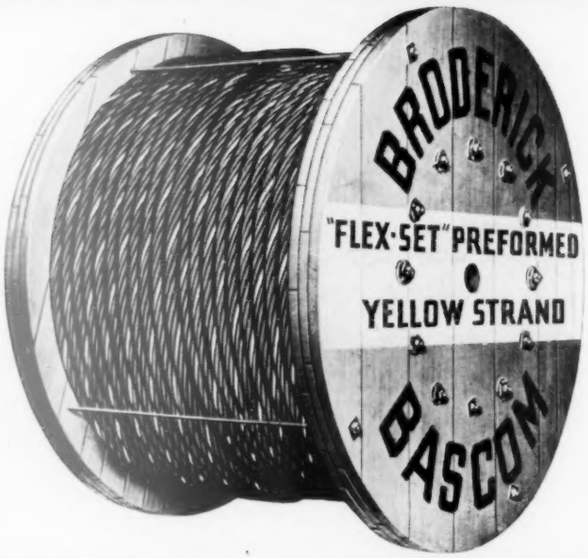
buell
DUST COLLECTORS

If you have a SMOKE problem ask also for *Fly Ash Booklet A93*, which gives all the essential facts in the fewest possible words, with the help of theory-at-a-glance illustrations.

SALES OFFICES IN PRINCIPAL CITIES

Check the Items that Meet Your Wire Rope Requirements

1. A limber rope—one that is easy to handle [ ]
2. A rope that is quickly installed [ ]
3. A rope that is largely "broken in" before you put it to work [ ]
4. A rope that may be used with comparatively small sheaves [ ]
5. A rope that is highly resistant to fatigue and kinking [ ]
6. A rope that spools evenly and runs smoothly [ ]
7. A rope that is quickly, easily, perfectly spliced and socketed [ ]
8. A rope that can be handled with more than ordinary safety [ ]
9. A rope that lasts exceptionally long [ ]
10. A rope that saves you money [ ]



How many did you check? If more than five—*any five*—the chances are that "Flex-Set" Preformed Yellow Strand is your best buy.

Preforming shapes the strands during manufacture to the helical form they will maintain in the rope—with the amazing results listed above. The original "well-balanced" properties of Yellow Strand are *still there—plus* the advantages gained by preforming.

Items 2 and 3 above are *specially important* on equipment whose ropes are renewed more or less frequently. "Flex-Set" Preformed Yellow Strand costs less to install; can be speeded up under full load in less time; lasts longer. Try "Flex-Set" Preformed Yellow Strand on power shovels, for hoist line, crowd rope, rack rope; on dragline machines, for dragline and hoist line; on clamshell buckets, for holding line and closing line.

FREE **Riggers' Hand Book**
55 pages of just the information every rigger needs and wants. Write today for your copy. No charge. No obligation.

Broderick & Bascom Rope Co.
ST. LOUIS

Factories: St. Louis—Seattle—Peoria
Branches: New York—Chicago—Seattle—Portland—Houston

No. U-7R6

"Flex-Set" Preformed Yellow Strand

IMPACT RESISTANCE
is built into
REPUBLIC CONVEYOR BELTING

During manufacture REPUBLIC guards against the ultimate causes of BELT failure.

● On many conveyor belting installations, where the handling of lump material is involved, continual buffeting at the loading point is the major factor of wear and tear. Other operating conditions inflict punishment and stress on a belt; but the hammering, gouging effect of falling rocks or coal demands superior construction for satisfactory performance.

In designing conveyor belting entirely capable of withstanding the destructive force of impact, Republic's technical and scientific facilities are brought to full use. Each phase of manufacture is controlled from the laboratories by careful supervision and thorough testing. The rubber compound used for the top cover or carrying side must conform to specifications for quality and thickness . . . assuring resistance to cutting and piercing by materials handled. Duck construction must possess sufficient strength and elasticity to stand up under concussion. The design and number of plies is determined to afford the necessary body and strength as a combined unit. Each element included bears its part of the brunt under severest conditions. For savings in operating costs, equip your belt conveyor with a Republic brand. Ask your Republic Distributor for his recommendation on your particular equipment. Republic Rubber Division Lee Rubber and Tire Corporation, Youngstown, Ohio.

REPUBLIC RUBBER

HOSE • BELTING • PACKING • MOLDED PRODUCTS

ORDER Republic RUBBER PRODUCTS FROM

THE ENSIGN-BICKFORD CO.
Simsbury, Connecticut

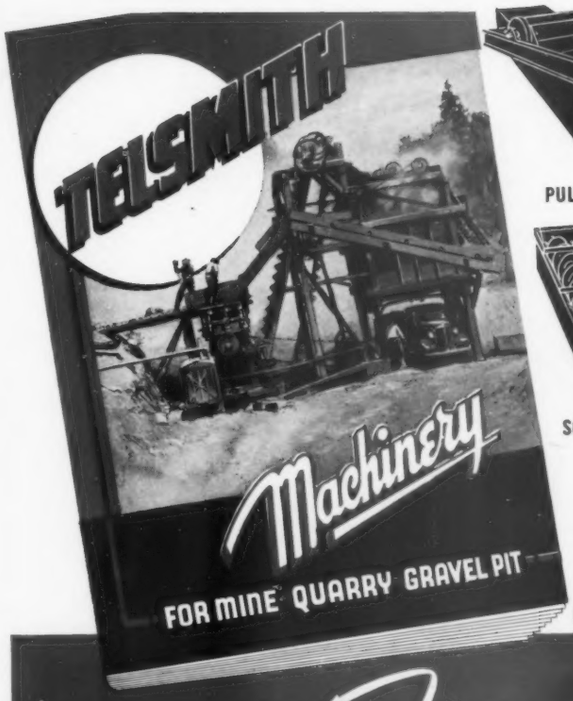
Makers of Cordeau-Bickford Detonating Fuse
—and Safety Fuse Since 1836

Primacord-Bickford Detonating Fuse can be set off by means of fuse and cap or electric blasting cap. In either case, *this one cap is the only cap required for the entire blast.* It is attached after all holes have been loaded and tamped—after all connections have been made—after all equipment and lines have been removed—after all men have gone to a place of safety. The cap detonates the Primacord. The Primacord detonates each and every cartridge in the blast—whether there is one hole or a thousand.

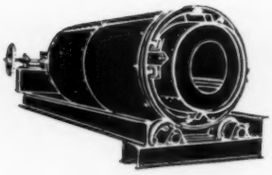
Primacord has greatly broadened the field for detonating fuse—as you will see when you read the Primacord Booklet. May we send you a copy?

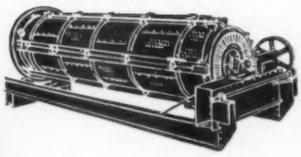
PRIMACORD·BICKFORD *Detonating Fuse*

PB7



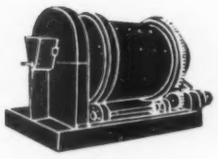
PULSATORS


WASHING SCREENS


DRY SCREENS

SCREW REWASHERS

LOG WASHERS


SUPER SCRUBBERS

BELT & BUCKET CONVEYORS

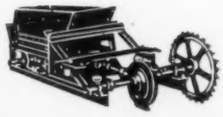
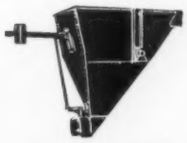


PLATE FEEDERS


SAND TANKS

GET THIS *Free* 1939 EQUIPMENT GUIDE

Get this new Telsmith "guide" to profitable operation. Bring yourself *right-up-to-now* on rock, ore and gravel handling machinery. Thirty-six pages! Two colors! Illustrations galore! And it's *free* on request.

You'll be interested in Telsmith's newest units—and how other Telsmith units, for years the standard of efficiency, have been *re-designed* and *improved* to give you higher speeds, greater capacities and a better product—with less trouble and lower up-keep.

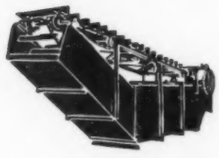
Only Telsmith's long and varied experience . . . Telsmith's close contact with plant operators and operating conditions all over the world . . . could produce a line of equipment, crushers to bin gates, *so modern and so complete!*

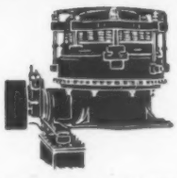
But even more valuable to you is Telsmith Engineering Service. Telsmith plans your entire plant . . . stationary, semi-portable or portable . . . exactly to suit *your* needs—selects the right machinery . . . synchronizes its operation. Telsmith centralized responsibility produces results! *Get the New Telsmith General Bulletin, E-15.*

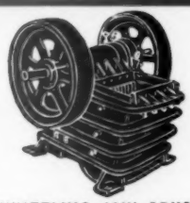
SMITH ENGINEERING WORKS, 504 EAST CAPITOL DRIVE, MILWAUKEE, WIS.

Cable Addresses: Sangworks, Milwaukee — Concrete, London
Associates in Canada: Canadian Vickers, Limited, Montreal and Vancouver
50 Church Street, New York City
711 Commercial Trust Bldg., Philadelphia, Pa.
419 Westinghouse Bldg., Pittsburgh, Pa.
211 W. Wacker Drive, Chicago, Ill.
51 Binney Street, Cambridge, Mass.
Brookside Mt. & S. S. Co., Louisville, Ky.

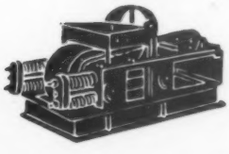
TELSMITH

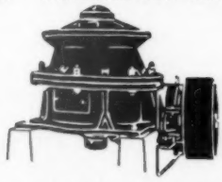

SAND DRAGS

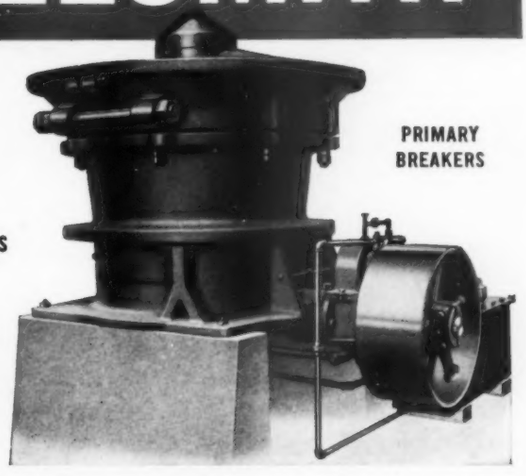

GYRASPHERE CRUSHERS


WHEELING JAW CRUSHERS

ROTARY GRIZZLIES


DOUBLE ROLL CRUSHERS


REDUCTION CRUSHERS


PRIMARY BREAKERS

TIMKEN ROCK BITS AT THE VICTORIA GRAVEL COMPANY, BURNET, TEXAS

This large quarry operator has proved that both increased production and decreased cost follow the use of TIMKEN Rock Bits. As a result TIMKEN Bits are used exclusively.

Most of the large-sized aggregate used in the construction of Mashall Ford Dam comes from this quarry. Approximately 700,000 tons will be shipped for this purpose.

The rock quarried here furnishes a real test for rock bits, hence the survival of the fittest—TIMKEN Bits.

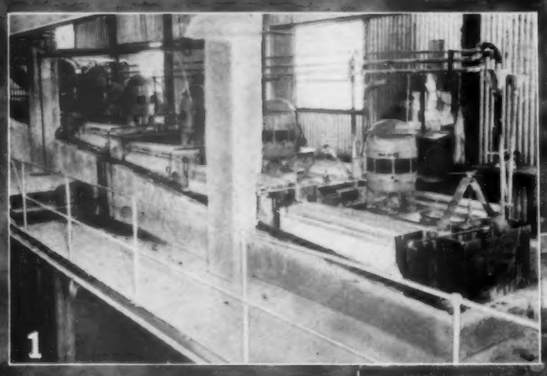
You too will find TIMKEN Rock Bits productive of large savings and increased output no matter what kind of rock you have to deal with nor what operating conditions may be encountered. It will pay you to adopt this modern rock drilling tool now. Write for further information.

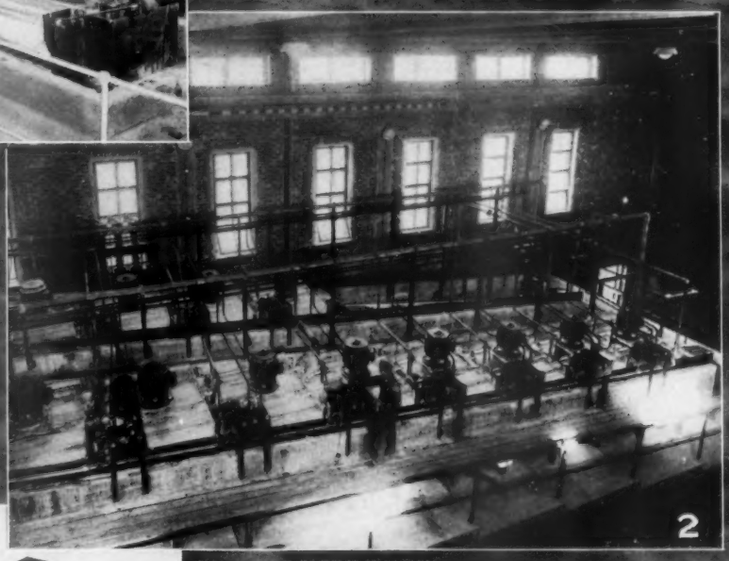
THE TIMKEN ROLLER BEARING COMPANY
CANTON, OHIO

TIMKEN
ROCK BITS

Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; TIMKEN Rock Bits; and TIMKEN Fuel Injection Equipment.

THE FLOTATION PROCESS in the CEMENT INDUSTRY





has for its object the improvement of inferior cement raw materials by removing the undesired quantities of minerals, making it possible to produce high quality cement from low-grade rock.

Cement raw materials from all parts of the world and of almost every type have been tested in our laboratories to determine process and reagents. Based on continuous tests on a semi-large scale in our pilot plant in Copenhagen, we have designed installations and determined operation costs for the introduction of the flotation process at several works. Of these, two are operating (Finland and South Africa) and another is being erected in South Africa.

For the whole world, with the exception of the United States, Canada and Mexico, we control all patent rights and are supplying machinery for the application of flotation in the cement and allied industries.

Fig. No. 1—Flotation plant, South Africa
Fig. No. 2—Flotation plant, Finland
Fig. No. 3—Flotation Laboratory and Pilot plant, Copenhagen

F. L. SMIDTH & CO. A/S
33, VESTERGADE. COPENHAGEN, DENMARK

Readers and Advertisers Alike Prefer PIT AND QUARRY

For nearly a decade Pit and Quarry has led the field in subscriptions among producers. Its popularity has grown constantly, its margin of lead increased steadily, not by any sudden bound due to special offers or inducements. Its volume of advertising in 1938 was definitely larger than that of any other paper in the field.

The reason? At no time has Pit and Quarry compromised with its high editorial standards. It has held its editorial staff, and kept its field editor on the road, wearing out a car in one to two years. The illustrations have always been plentiful, the articles easy to read.

Costly to do this? Yes, it is. But it has been worth the cost, for producers realize that Pit and Quarry has worked with them. And the high percentage of subscribers who renew their subscription attests their loyalty to a publication understanding their problems and working with them.

The subscription price is still only one dollar for a full year's service. If you are not already a subscriber, why not send in a dollar and learn why other producers find Pit and Quarry so valuable? The cost is small—the results so large—don't delay.

Return This Coupon To-day—Start Your Subscription with the April issue

PIT AND QUARRY PUBLICATIONS,
538 So. Clark Street, Chicago, Illinois.

Enclosed find remittance for which enter my subscription to Pit and Quarry for.....
1 year ($1.00).....starting with the April issue. (Foreign add $1.00 per year.)

My Name..... Title.....

Company Name .....

Send to (Address).....

We Produce.....

Here is that NEW CRUSHER you have been waiting for

Makes a more cubical and desirable product

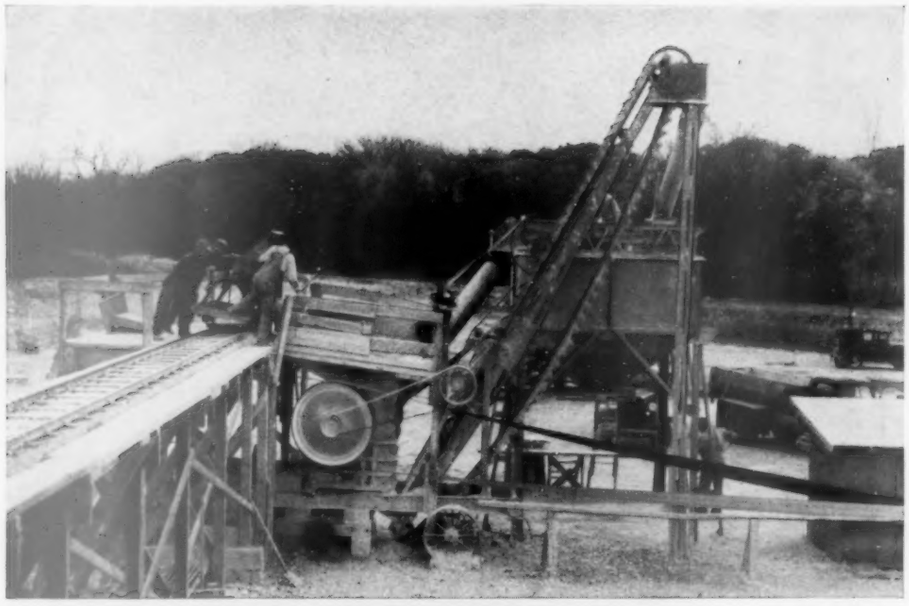
Here is the crusher that fills a long felt need, especially by those faced with the task of making a product to meet today's specifications from a material which has a tendency to break slabby. With its different crushing action, more cubical shaped particles are produced than with any other type of crusher where crushing is done by impact. This superior product brings a premium price in any market.

Another feature of the Symons Impact Crusher, and one which appeals to producers of crushed materials, is its flexibility. It readily fits into the average crushing plant and provides a wide variety of products, from sand to the intermediate sizes. It also makes more of those extremely fine sizes so often required for blending in order to give the proper gradation as required in the newer specifications.

Each fine crushing job has its own particular problems. In some instances, an Impact Crusher may be preferable; for other jobs, the Symons Cone Crusher. As builders of both machines, Nordberg is in a position to aid in the solution of your fine crushing problems.

NORDBERG MFG. CO. MILWAUKEE WISCONSIN

SYMONS IMPACT CRUSHER



Universal 18"x36" Portable Roller Bearing Crusher produces road materials at the lowest cost for this Pennsylvania operator.

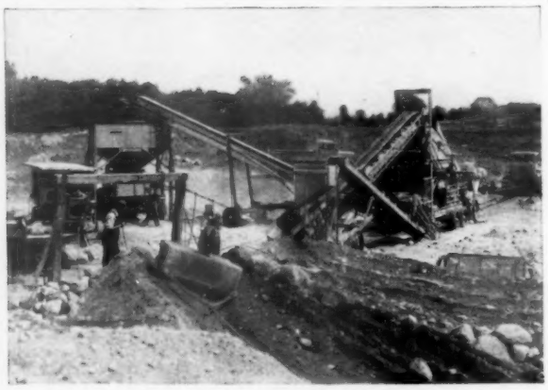
Below: Keeping the 21-yard bin full is "duck soup" for this Universal Dual Crushing Plant — one of 50 Universal types.

HOW TO MAKE CRUSHED STONE AT THE LOWEST COST!

Get a Universal Crusher or Plant — there's a size and type for every need — and put it to work for you. It will give you higher production without even crowding; the crusher's wide feed openings and the force feed, double-action stroke delivered at every revolution take care of that.

You'll grind out more tons a day and you'll save from a nickel to a half-dollar on every ton figured over a fiscal period. These savings result from faster output, more uniform crushing, less rejects, and lower operating and maintenance costs. Why take our word for it — *ask to see user reports and names of users in your vicinity.*

Write for bulletins on Universal Bronze and Roller Bearing Crushers; Crusher-Pulverizer Combinations; Stationary, Portable and Semi-Portable Crushing, Screening and Loading and Washing Plants.



Below: "It's like grinding coffee" with a Universal Pulverizer—look at that "man-size" stone going in and the "fine" fines coming out and almost as fast as sliding it right into the truck.

UNIVERSAL CRUSHER COMPANY

619 C Avenue West, Cedar Rapids, Iowa

UNIVERSAL

KOEHRING

Wheeler method
Moves Dirt • Faster • Cheaper

KOEHRING HEAVY-DUTY

Loads of power to load — exceptionally high speed for travelling — Push tractor applies power where needed, ***behind*** the cutting blade. High speed, time-tested job-proven Koehring Tractor hauls the Wheeler to and from the dump. Write for information about costs and production of ***This Newest Method— The Koehring Wheeler Method***

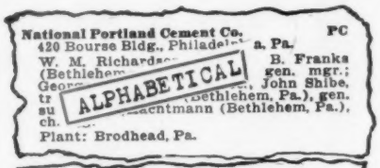
KOEHRING COMPANY
MILWAUKEE • WISCONSIN

HEAVY-DUTY CONSTRUCTION EQUIPMENT

BE AMONG THE FIRST TO ACQUIRE THIS NEW MAILING LIST

. . Order Your Copy Now!

. . . . *Alphabetical*, by Company Names →



. . . . *Geographical*, by Plant Location →

Hundreds of New Names . . . Others Checked and Revised

The 1939 Directory section of Pit and Quarry HANDBOOK is the most complete ever published. It is up to the minute—as modern as skill and money can make it. It's checked and double checked. Copies are now available.

It gives you the names of the companies, their officers, the number and locations of plants, their capacities and equipment, and the names of the men who buy.

The technical section gives the latest production methods and practices. And there are consolidated catalogs of equipment.

The new and 32nd edition will be of greatest benefit to those who order promptly and receive their copy immediately. Use coupon below. Select either the complete Handbook and Directory, or the convenient Directory alone in smaller, flexible binding, more convenient for salesmen. The price is the same in either case.

1939 Edition Just Off the Press . . . Order Your Copy Today!

Pit and Quarry, Date.....

538 S. Clark St., Chicago, Ill.

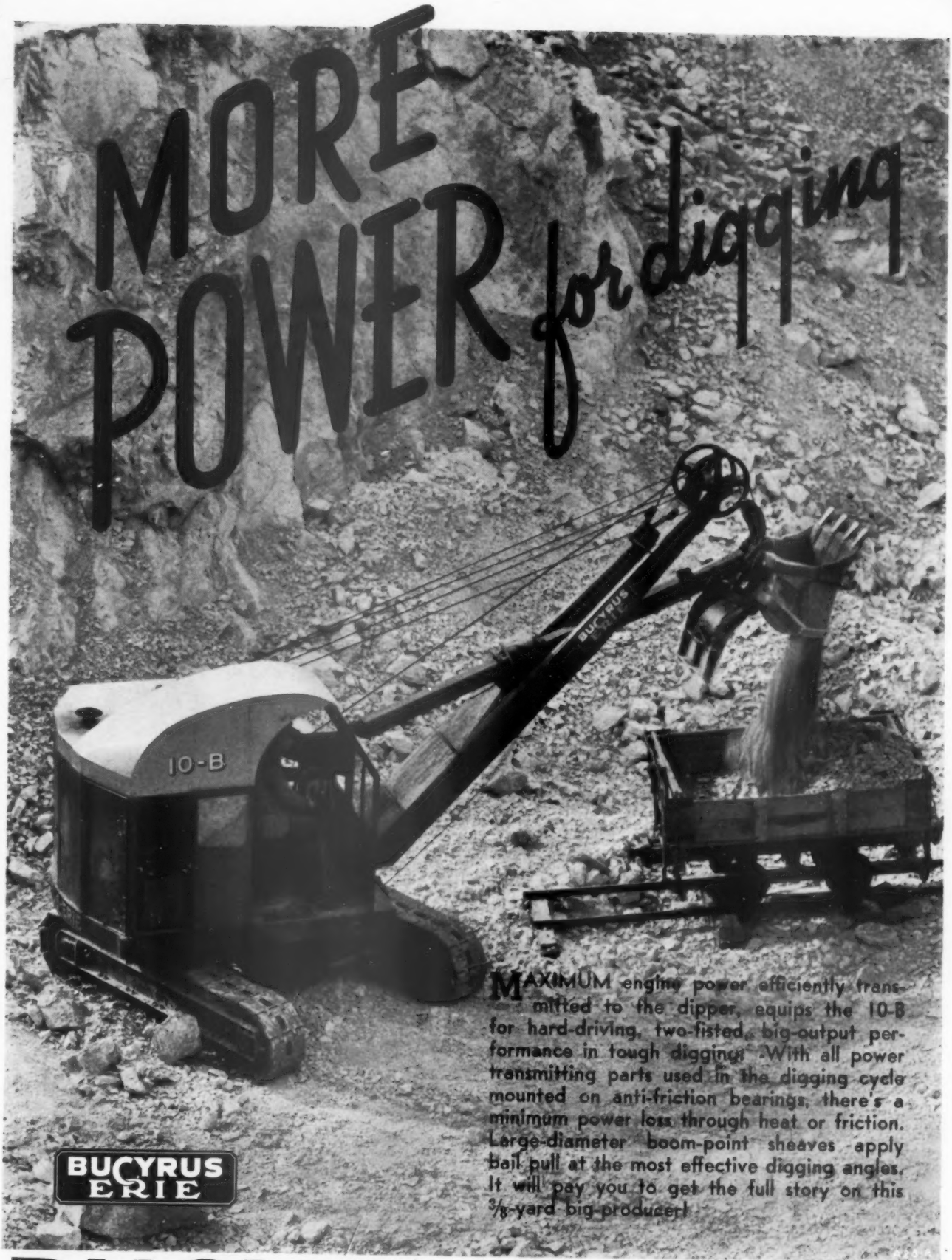
Please send.....copies of the 1939 HANDBOOK ($10.00 per copy) ☐ Check enclosed.....

Please send.....copies of the 1939 DIRECTORY ($10.00 per copy) ☐ Send Invoice with book

Name ..... Title.....

Company .....

Town ..... State .....



MAXIMUM engine power efficiently transmitted to the dipper, equips the 10-B for hard-driving, two-fisted, big-output performance in tough digging! With all power transmitting parts used in the digging cycle mounted on anti-friction bearings, there's a minimum power loss through heat or friction. Large-diameter boom-point sheaves apply bail pull at the most effective digging angles. It will pay you to get the full story on this ⅜-yard big-producer!

BUCYRUS - ERIE

SOUTH MILWAUKEE, WISCONSIN, U. S. A.

Do You Know That . . .

"siliceous dusts are not soluble in the body fluids, and when introduced into the respiratory tract in the form of particles of the proper sizes and in sufficiently high concentration produce nodular growths that often result in silicosis." (p. 375, *Dust Collection.*)

"the essential points to bear in mind when selecting compressor oils are that they should possess adequate viscosity at the operating temperatures and that they show little tendency to vaporize or to deposit hard carbon residues." (p. 569, *Lubrication.*)

"rock is ready for pulverizing when it has been brought to about 1½ in. in diameter." (p. 185, *Crushing, Grinding and Air Separating.*)

"a dredging pump makes its greatest power demands when pumping large quantities against very low heads. In figuring . . . . . (p 56, *Hydraulicking and Dredging.*)

"the general advantages of punched plate are that it gives a maximum area of wearing surface, is rigid, has openings of uniform size, is more readily adjusted than screen frames, has no tendency to pull away or sag, does not tear out, and certain parts may be left blank." (p 265, *Screening, Classifying, and Washing.*)

These and thousands of other equally interesting and useful facts will be found in the 1939 edition of Pit and Quarry Handbook. Are you using your copy as often as you should? Do you turn to it when you are brought face to face with a new, baffling problem?

Whether the question is one of plant design or plant operation you can be almost certain of finding help in the handbook. Open it to-day—at any chapter, at any page—and see if it does not repay you for the time and effort with new facts, new interpretations, new slants. Get the habit of making it serve you as it does many hundreds of other "practical" and "technical" operating men.

If you are a producer of aggregates, cement, lime, gypsum or other nonmetallic minerals and do not own a copy of the new edition of Pit and Quarry Handbook, send in your application for one on your company letterhead. Simply state what use you expect to make of it, and what your position is. We still have a limited number of copies available for free distribution among nonmetallic-mineral producers only.

PIT AND QUARRY HANDBOOK
538 South Clark Street **Chicago, Ill.**

FROM THE DAILY REPORT OF A
TIGER BRAND WIRE ROPE ENGINEER

"You're just the man I'm looking for," says the foreman when I walked in here this morning. He has been keeping service records on wire rope, and lately, performance has been falling off. He wanted to know whether he should try a new construction or a new grade.

"How long since you've regrooved those sheaves?" I asked. Nobody even remembered when they had been last regrooved!

Sure enough, that's where the trouble lay. The grooves had worn down so that the proper size gage nowhere near bottomed. Also they were badly scored. Now they're regrooving, and I'll bet you a hat the rope will last twice as long.

Yours,

al

— HOW LONG SINCE YOU'VE REGROOVED THAT SHEAVE?

TO get maximum rope life on your equipment, be sure to check grooves in sheaves and drums at regular intervals for size, contour, and depth. Such inspections are especially important when new wire ropes are to be installed.

Sheaves, drums, and wire ropes are moving parts, subject to wear. Rope travel causes groove wear. Consequently, as rope diameter decreases, grooves become deeper and narrower. Putting a new full-diameter rope in worn grooves causes a binding action that invariably deforms the rope, and cuts short its useful life.

Groove contours should also be inspected periodically for uneven wear, a condition which causes vibration, noisy operation, and generally poor service.

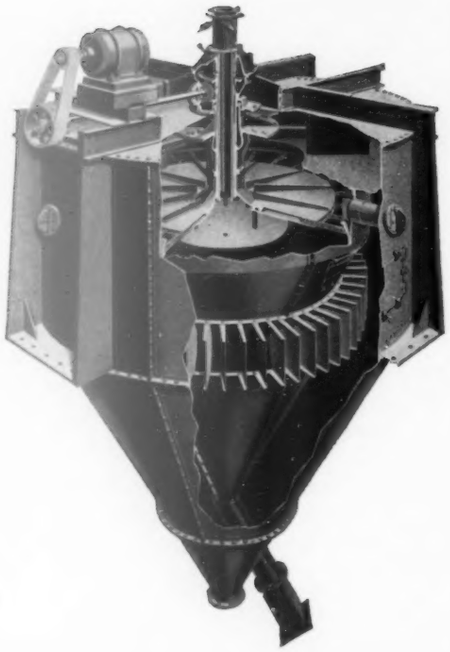
Whenever you find sheaves and drums which show evidence of excessive or uneven wear, regroove them. It will pay you big dividends in longer rope life and all-round better operation. Don't let worn grooves rob you of the performance you can expect from good wire rope.

USS
EXCELLAY
Preformed
WIRE ROPE

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

EXTREME HIGH FINENESS



RAYMOND DOUBLE WHIZZER Mechanical Air Separator

WHEN you produce materials of microscopic fineness and constant uniformity, you need the super degree of classification made possible by the Raymond DOUBLE WHIZZER Mechanical Air Separator.

This machine is giving results far beyond those obtained by the single whizzer or from any other type of separator known today. In a recent installation, a lime products plant is getting a remarkably high percentage of finished material, testing 10 microns and under, in classifying a special grade of calcium carbonate. This new commercial process has proved particularly satisfactory in making a superior product at reduced cost.

If you have any such problem in superfine separation, Raymond engineers can give you the benefit of specialized experience. Your inquiries are invited on the production of low micron sizes of:

Bentonite	Cement Clinker	Phosphate Materials
Kaolin	Raw Mix	Hematite
Calcium Carbonate	Hydrated Lime	Magnesite
Limestone	Pigments	Talc
Trap Rock	Chalk	Slate
	Gypsum	

Write for Raymond Separator Catalog No. 30

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1321 North Branch Street **CHICAGO**
Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

©CIB 419802

PIT AND QUARRY

Vol. 31 April, 1939 No. 10

CONTENTS

News of the Industry 23
Editorial: Public Confidence in Advertising 30
Gravel Plant Generates Own Power with 120-Hp. Diesel 32
Medusa of Canada Opens Small Plant for Special Cements 33
Technical Developments in Industrial Minerals Revealed at AIMME Meeting 35
Performance Measurement and Mechanical Control—II 39
Adds New Lime Department and Triples Crushed-Stone Output 41
Pyrophyllite Mining Undergoes Revival . . . 42
Symposium on Lime Is Program Feature at ASTM Gathering 44
Dust Exposure in New York Quarries 45
State Legistures Enact But Few of Threatened Handicaps to Operators 47
Wisconsin Producer Finds Portable Plants Ideal for Highway Jobs 50
Safe Practice in Handling Wire Rope 52
Pioneer Pennsylvania Quarry Making Ready-Mixed Concrete 68
14 Points for Sales Success 70
New Concrete-Block Producer Finds Quality Product Sells 72

Personal Mention 53
Traffic News Digest 56
Foreign Developments 57
Occupational Diseases and the Law . . . 58
New Machinery and Supplies 60

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyrighted 1939 by Complete Service Publishing Co., 538 South Clark Street, Chicago, Ill.

H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

Field Editor:
W. E. TRAUFFER

Assistant Editor:
HARRY F. UTLEY

Contributing Editors:
WILLIAM C. RIETH
W. R. CLIFFE

Circulation Manager:
W. T. KLUSSMAN

Advertising Manager:
JAMES E. MONTGOMERY
Telephone HARrison 9357
Chicago, Ill.

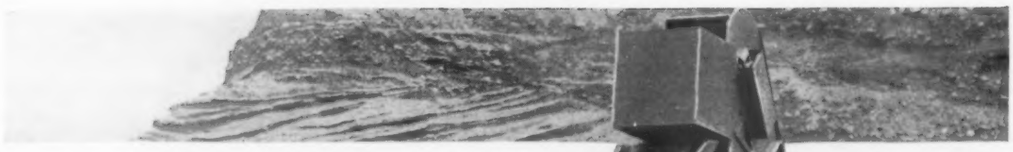
Eastern Advertising Manager:
W. A. WILSON
Room 430, 122 East 42nd St.
Telephone CALedonia 5-4438
New York, N. Y.

Central Advertising Manager:
W. H. SANDERSON
Auditorium Bldg.
Telephone CHerry 4432
Cleveland, O.

Advertising Representative:
D. R. EGBERT
Chicago, Ill.

Field Representatives:
A. C. PETERSEN
J. K. GARESCHE

MEMBER AUDIT BUREAU OF CIRCULATIONS



Gravel Bank Excavation with a HAISS MODEL 80

. . . a high production low cost job

From the standpoint of purchase price, operating cost, efficiency, flexibility, close clean-up, and clean level floor—from all of these the Haiss Loader will prove itself your first choice. Cobble guard plates and avalanche protection extend its usefulness to all except the most tightly cemented and big boulder filled banks. . . . There are 4 great Haiss Loaders for bank excavation, stockpile loading and general service. Capacities range from 2½ to 8 yards a minute. Big-capacity machines which put loading on a bed-rock economy basis. Ask us to send you a set of 1939 Specifications.

HAISS

WHO FOR OVER 45 YEARS HAVE CREATED AND SOLD NONE BUT EQUIPMENT OF DEMONSTRABLE SUPERIORITY IN DESIGN AND MANUFACTURE.

The HAISS HI-POWER, too, is TOPS in its field!

A bucket that has crane operators talking about it wherever it goes on the job. Speed and power in rare combination. Has won "bouquets" of praise on underwater work, dredging bridge pier foundations in 45 feet of deep water. A bearcat at gripping hold of difficult boulders—as letters on file bear repeated testimony. Digs deep and brings out a full pay load. A bucket with which to make money in tough ground. . . . Prices and descriptive bulletins on request.

Stocked in New York, Philadelphia, Baltimore, Atlanta, Hartford and Los Angeles

GEORGE HAISS MANUFACTURING COMPANY, INC.

142nd Street and Rider Ave., New York, N. Y. • *Distributors Everywhere*

ALSO PORTABLE BELT CONVEYORS, REVOLVING SCREENS, ELEVATORS & CONVEYORS, HOPPER GATES

PIT AND QUARRY

CHICAGO APRIL, 1939

Ask Seasonal Rating for Gravel Industry

PRODUCERS GET QUESTIONNAIRES

Since the sand-and-gravel industry in some parts of the country appears to have seasonal characteristics within the meaning of the Federal Wage and Hour Law and the regulations issued by its Administrator, the National Sand & Gravel Assn. is developing information to support an application to the Administrator for recognition of the industry as a seasonal enterprise entitled to the exemption stipulated in the act.

A questionnaire is being sent out by the association to all sand-and-gravel producers of record. Prompt return of the questionnaires with the information requested is urged by Executive Secretary V. P. Ahearn. Any producer not receiving a copy should write the association at once. Its address is the Munsey Bldg., Washington, D. C.

Repairs in Progress at Colorado Cement Plant

Repairs on the Colorado Portland Cement Co. plant north of La Porte, Colo., badly damaged by a dynamite blast in February which killed two men, are being made and will be completed in a few weeks, according to Superintendent Ira Dilts.

A crew of 90 men is rebuilding the damaged structures. The office building and garage will be replaced with a new structure.

New Florida Phosphate Plant Near Completion

The new $250,000 phosphate-rock plant of the Camp Concrete Rock Co. near Brooksville, Fla., is practically complete and production is expected to get under way shortly. The plant is located on a property comprising 600 acres, the main building being 1,500 ft. long. Water will be obtained from three deep wells and the pumps will have a capacity of 5,500 gal. per min. The concrete loading tunnel, 6 ft. by 7 ft. in size, is 460 ft. long.

The Florida Power Corp. cleared about 6 mi. of right-of-way to construct a power line to the plant and the Seaboard Rwy. laid 7,500 ft. of track from its main line to the plant. Sixteen houses for employees have been erected and more are to be built later.

The capacity of the plant is 200 tons per hr.

Industrial Sand Assn. to Meet May 24-26

The fourth annual convention of the National Industrial Sand Assn. will be held at the Ambassador Hotel, Atlantic City, N. J., on May 24, 25, and 26. Convention proceedings will commence with the annual meeting of the Board of Directors at 2:00 p.m. on May 24; there will be morning and afternoon sessions on May 25; and May 26 will be devoted to plant inspections in the South Jersey area.

Erects 200-Ton Tripoli Plant Near Seneca, Mo.

The Barnsdall Tripoli Corp., Seneca, Mo., has begun construction of a new $100,000 200-ton tripoli plant, to replace the plant destroyed by fire last summer. It will be an all-steel plant, equipped with new machinery throughout and so designed that 10 men will do the work of 18 formerly employed in the old plant.

The corporation operates two tripoli quarries near the plant site and purchases tripoli from other producers in the district.

Ohio Gravel Producer Improves Facilities

The Morrow Sand & Gravel Co. has completed a number of improvements at its plant located near Fulton, O.

New washing-and-sizing equipment was included in the machinery installed.

Florida's Cement Tax Finally Held Invalid

SUPREME COURT ISSUES RULING

On February 27, 1939, the United States Supreme Court unanimously affirmed the injunction of the Federal District Court for the Northern District of Florida restraining the enforcement of a Florida statute which provided for the inspection of cement imported from foreign countries and collection of an inspection fee of 15c. per hundredweight. The decision in effect overrules a prior decision of the Supreme Court of Florida that the tax was valid.

The statute involved is Chapter 18995, Florida Laws of 1937, which provided for the inspection of all imported cement and the payment for such inspection of a fee of 15c. per 100 lb. On July 27, 1937 a petition for mandamus was filed in the Supreme Court of Florida by the State of Florida *ex rel.* Florida Portland Cement Co. to compel the state road department to enforce the statute, and on the same day an alternative writ of mandamus was issued. A demurrer raising the question of the constitutionality of the law was overruled on October 12, 1937 (*State v. Hale,* 129 Fla. 588), and a peremptory writ of mandamus, on November 17, 1937, directed the road department to enforce the statute.

Meanwhile, on November 4, 1937, the Bimco Trading, Inc., filed a complaint in the Federal District Court to enjoin the enforcement of the statute. On November 27, 1937, the District Court granted an interlocutory injunction restraining the road department from enforcing the statute, and on December 9, 1937, the Florida Supreme Court ordered that all further proceedings and actions pursuant to its mandamus be stayed until the final decision of the U. S. Supreme Court. The Federal District Court on June 14, 1938, entered a final decree permanently enjoining the enforcement of the law, and

the decision was appealed to the Supreme Court. It was this appeal, under the title of *Hale et al. v. Bimco Trading, Inc., et al.*, which was decided by the Supreme Court on February 27, 1939, the decision being an affirmation of the judgment of the lower Federal court.

The preamble to the Florida law concerned recited that "during the past twelve months approximately thirty per centum (30%) of all cement sold and used in Florida was manufactured in foreign countries and imported"; that cement is "an integral part of the construction" of large numbers of buildings; that "much of the foreign manufactured cement . . . brought into the State of Florida has been of inferior quality"; that "the importation . . . and use of foreign cement not only jeopardizes public safety but amounts to unfair competition being forced on this great industry in Florida."

The complaint alleged, and it was not contested, that the 15c. fee is 60 times the actual cost of inspection, and the government (appearing in the case as *amicus curiae* and defending the national interest represented by the Trade Agreements Act) "gave perspective" to the size of the 15c. fee by comparing it with the duty of 6c. per 100 lb. fixed by the Hawley-Smoot Tariff Act of 1930 and with the duty of 4½c. fixed by the Belgian Trade Agreement of 1935.

The Supreme Court's opinion, written by Justice Frankfurter, points out that "as grounds for this discrimination in the incidence of an obviously onerous exaction as between foreign and domestic cement, the preamble of the statute states that 'it is of paramount importance to the public safety that only cement measuring up to a minimum standard should be offered for sale, sold or used in the state of Florida,' and that the importation 'amounts to unfair competition being forced on this great industry in Florida.' So far as public safety demands certain standards in the quality of cement, such safety is dependent on assurance of that quality by approximate inspection no less of the 70 per cent. domestic cement than of the 30 per cent. obtained from abroad. That no Florida cement needs any inspection while all foreign cement requires such inspection at a cost of 15 c. per hundred weight is too violent an assumption to justify the discrimination here disclosed. The other justification—the competitive effect of foreign cement in the Florida market—is rather a candid admission that the very purpose of the statute is to keep out foreign goods. . . . According the statute every presumption of validity, no reasonable conjecture can here overcome the calculated discrimination against foreign commerce.

RECENT GOVERNMENT CONTRACTS FOR MATERIALS UNDER THE PUBLIC CONTRACTS (WALSH-HEALEY) ACT

Date of Delivery 1939	Source of Supply	Government Agency	Commodity	Amount
3/31	Amsden Co., Amsden, Vt.	Agriculture	Grd. limestone	Indefinite
3/31	New England Lime Co., Adams, Mass.	Agriculture	Grd. limestone	Indefinite
2/28	Solvay Sales Corp., Detroit, Mich.	WPA, Treas., Proc.	Crushed stone	$10,700.00
Indef.	Lone Star Cement Corp., Birmingham, Ala.	WPA, Treas., Proc.	Portland cement	10,700.00
Indef.	Penn-Dixie Cement Corp., Atlanta, Ga.	WPA, Treas., Proc.	Portland cement	24,300.00
3/31	Universal Atlas Cement Co., Chicago, Ill.	WPA, Treas., Proc.	Portland cement	14,760.00
Indef.	Medusa Portland Cement Co., Chicago, Ill. Northwestern Portland Cement Co., Seattle, Wash.	Treas., Proc.	Portland cement	Indefinite
2/22	United Concrete Pipe Corp., Torrance, Cal.	WPA, Treas., Proc.	Concrete pipe	10,961.44
6/30	Basalt Rock Co., Inc., Napa, Cal.	Navy Purchasing Of	Concrete	110,080.00
6/20	Superior Portland Cement, Inc., Seattle, Wash.	War, QMC	Portland cement	14,927.00
4/4	Superior Portland Cement, Inc., Seattle, Wash.	Puget Sd. Navy Yd.	Portland cement	12,672.00
3/15	Lehigh Portland Cement Co., Ormrod, Pa.	P.Rico Recon.Admn.	Portland cement	39,735.00
Indef.	G. S. Chastain, Decatur, Ill.	WPA, Treas., Proc.	Concrete pipe	36,725.90
3/31	Lee Lime Corp., West Stockbridge, Mass.	Agriculture	Pulverized limestone	Indefinite
3/31	D. U. Smith & Brother, Ashley Falls, Mass.	Agriculture	Agricultural limestone	Indefinite
3/31	Hoosac Valley Lime Co., North Adams, Mass.	Agriculture	Grd. limestone	Indefinite
3/31	Harris Lime Co., Lime Rock, R. I.	Agriculture	Grd. limestone	Indefinite
3/16	Michigan Limestone & Chemical Co., Detroit, Mich.	WPA, Treas., Proc.	Crushed stone	11,400.00
8/31	California Portland Cement Co., Los Angeles, Cal. Riverside Cement Co., Los Angeles, Cal.	War, Engineers	Portland cement	95,500.00
Indef.	Lawrence Portland Cement Co., Siegfried, Pa. Giant Portland Cement Co., Egypt, Pa.	WPA, Treas., Proc.	Portland cement	25,250.00
6/30	Louisville Cement Co., Speed, Ind.	WPA, Treas., Proc.	Portland cement	11,346.00
3/3	The Toledo Concrete Pipe Co., Toledo, O.	WPA, Treas., Proc.	Concrete pipe	10,709.20
6/30	Gray Concrete Pipe Co., Arlington, Va.	Treas., Proc.	Concrete pipe	Indefinite
5/26	John P. Callaghan, Inc., Harrison, N. J.	WPA, Treas., Proc.	Ready-mixed concrete	14,125.00
6/30	American Limestone Co., Mascot, Tenn.	Agriculture	Agricultural limestone	Indefinite
6/30	Glacier Gravel Co., Seattle, Wash.	Puget Sd. Navy Yd.	Aggregate	12,000.00

"Such assumption of national powers by a state has, ever since March 12, 1827 (*Brown v. Maryland,* 12 Wheat. 419), been found to be in collision with the Constitution. It can never be pleasant to invalidate the enactment of a state, particularly when it bears the imprimatur of constitutionality by the highest court of the state. But it would not be easy to imagine a statute more clearly designed than the present to circumvent what the commerce clause forbids."

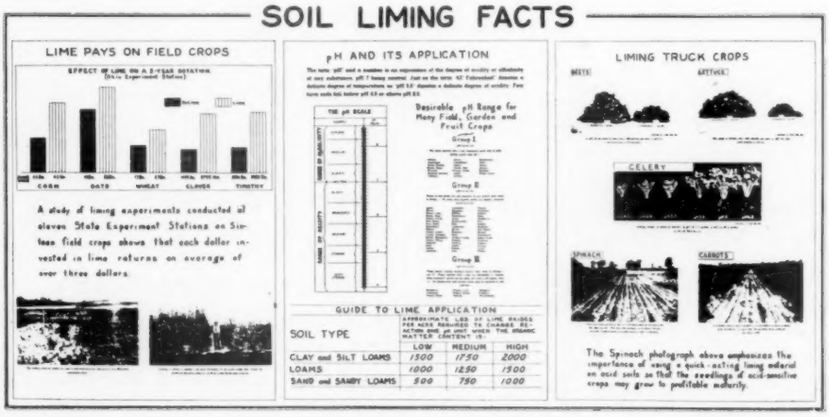
Appeals Court Upholds Phosphate-Rock Process

The United States Circuit Court of Appeals, sitting at Philadelphia, has sustained patents owned by Phosphate Recovery Corp. of New York, on a process for recovering phosphates in Florida. At the same time the court ruled invalid a similar patent owned by Southern Phosphate Corp. of Baltimore, which was engaged in litigation with the New York corporation over the patent rights.

Cement-Fee Case in Michigan Is Settled

The Wabash Portland Cement Co. case, which involved failure to pay state fees for the privilege of doing business in Michigan, has been settled, it was announced by Carl A. Olson, head of the Michigan Corporation and Securities Commission and Willard McIntyre, deputy attorney-general.

The firm, incorporated in Indiana but with its offices in Detroit, paid the state $12,000 in lieu of penalties and promised to pay the privilege fees in the future.


SOIL LIMING FACTS
LIME PAYS ON FIELD CROPS
A study of liming experiments conducted at eleven State Experiment Stations on Sixteen field crops shows that each dollar invested in lime returns on average of over three dollars.
pH AND ITS APPLICATION
Desirable pH Range for Many Field, Garden and Fruit Crops
GUIDE TO LIME APPLICATION
SOIL TYPE
LOW
MEDIUM
HIGH
CLAY and SILT LOAMS 1500 1750 2000
LOAMS 1000 1250 1500
SAND and SANDY LOAMS 500 750 1000
LIMING TRUCK CROPS
BEETS
LETTUCE
CELERY
SPINACH
CARROTS

The three-in-one chart entitled "Soil Liming Facts," reproduced above, has been printed in large poster size by the National Lime Assn. for use by its members. It is expected that the charts will be posted in dealers' warehouses.

Welding Saves Dipper Damaged by Blast

REPAIRS MADE AT FACTORY

It was just another day to the operator of a certain 5-cu. yd. shovel occupied in stripping service out in Pennsylvania. His shovel was working smoothly, and with his three-day old manganese, all-welded P&H bucket, he was really "piling up" yardage. Full data are not available to give a true picture of the tranquillity of his mind, but no data are necessary to picture his consternation when he easily forced the dipper into an innocent-appearing bank which harbored an unexploded charge of dynamite. One big "bang" and his cloudless day was ruined, as was also his new 5-cu. yd. dipper.

When he and his superintendent inspected the erstwhile trim appearing bucket, they found that the whole dipper was blown off-square about 7½ in. —that the manganese lip was bent approximately 2½ in. and that one tooth insert was cracked. From their deductions it was agreed that the explosion evidently occurred on the left side (when facing the dipper) directly under the bail hinge. The bail was twisted—the twist causing a break in the weld at the corner. There was also a break in the weld between lip and shell on the left side. This weld, however, had not failed until the lip had been bent 2½ in. out of line. They also found that in spite of the distortion of the dipper there was no cracking in the dipper door or shell other than those between the lip and the shell. "Well," said the superintendent, "it looks like a new dipper for us."

On checking up, however, he found that his assumption was wrong. After contacting the manufacturer, the Harnischfeger Corp. of Milawukee, it was decided that the dipper could be put into A-1 shape by welding at less cost than the replacement would have meant. Some skeptics said it couldn't be done, but with skilled welders, ably directed, using kerosene torches to force the dipper back into shape, and P&H-Hansen welders to repair the damage, the dipper was recommissioned and sent back to the job with a saving of almost 40 per cent. of the first cost! All welds are locally stress-relieved.

The 5-cu. yd. welded dipper before leaving the shops for service.

The explosion threw the dipper 7½ in. off center, a repair job that was met economically by welding.

There is a distinct moral to this story other than the first one which is, "don't try to handle dynamite with a 5-cu. yd. shovel"—and this moral is, "welding, with the modern electric arc and modern electrodes, is a maintenance and repair tool that should not be overlooked when seeking to cut costs of repairs on heavy equipment."

All-Steel Gravel Plant Started in Indiana

Work has been started by the Myers Gravel & Sand Co. of Anderson, Ind., on a new $25,000 plant near Alexandria.

Claude P. Myers, vice-president, states that the plant is of all-steel construction. The new plant will be capable of producing 450 cu. yd. daily. Officials of the company expect to have the plant in operation about April 10.

The present plant operated by the company will gradually be abandoned, and the old pit, now full of water, will be made into a lake for fishing.

Joplin Gravel Concern Erects Crushing Plant

The Independent Gravel Co., Joplin, Mo., is building a $10,000 plant near Rogers, Ark., according to Frank Sizemore, sales manager.

Output will include ground limestone for agricultural use and road-building material.

Strength Data Sought on Vibrated Concrete

TESTS UNDER WAY AT COLUMBIA

Improvements in the methods of placing concrete in large dams, buildings and other major structures will result from tests of bond strength, now being conducted at Columbia University, it was announced by Prof. R. R. Zipprodt, of the civil engineering department.

"The new method is mechanical and consists in vibrating the concrete after it has been placed in forms by means of a vibrating element from 12 to 24 in. in length and from 1½ to 2 in. in diameter, sunk in the concrete and electrically operated at speeds varying from 5,000 to 10,000 impulses a minute," explained Prof. Zipprodt. "This compacts the concrete over an area 2½ to 3 ft. in diameter surrounding the vibrator, which is moved from place to place by a skilled worker.

"We know definitely that this method is considerably more effective in densifying and compacting concrete than hand placing. We are attempting here at Columbia to determine exactly to what extent the bond strength is improved or lowered by this method."

500 Men Get Plant in Readiness for Season

Nearly 500 men have been at work at the extensive operations of the Michigan Limestone & Chemical Co., Rogers City, Mich., for the last couple of months preparing the plant and quarry for the opening of its season.

A fleet of shovels and Diesel-powered bulldozers have been conducting stripping operations as weather permitted; obsolete screens have been replaced with larger, more efficient units; conveying systems have been rearranged; capacity of the sand and special-sizes storages have been increased.

The program in general provides for closer sizing and increases the amount of sized stone recoverable from the quarry-run material.

$50,000 Ready-Mixed Plant at New Albany

Work is in progress at New Albany, Ind., on a $50,000 ready-mixed-concrete plant by the recently-organized New Albany Ready Mix Concrete, Inc.

Don Young of Kokomo, Ind., company engineer, is supervising the construction. The firm is headed by Maj.-Gen. Robert Tyndall of Indianapolis, Ind. G. H. Morrow, Kokomo, is secretary-treasurer.

Residential Building Highest in 10 Years

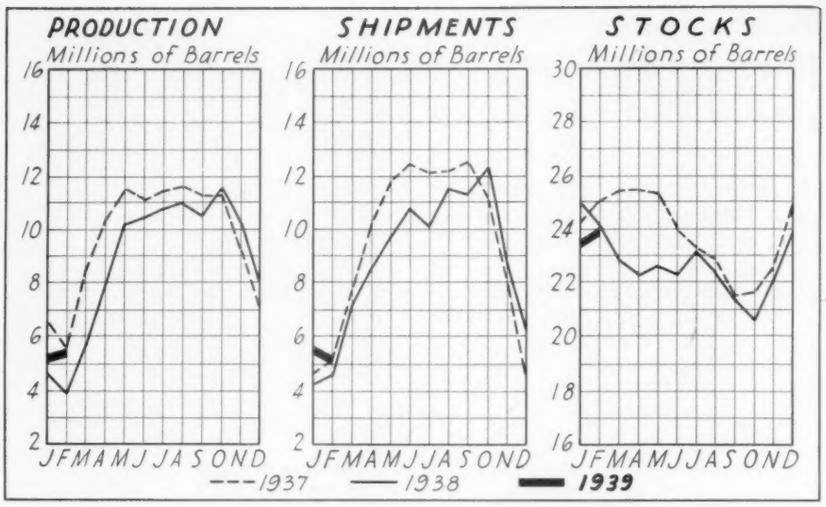
PRIVATE WORK MAKES GAINS

At no time since 1929 has the February volume of residential building equaled the total for February, 1939. Residential contracts awarded in the 37 eastern states amounted to $79,020,000, according to the F. W. Dodge Corp. This total represents a gain of 98 per cent. over the February, 1938 total which amounted to $40,023,000.

The combined total of residential contracts for the first two months of this year was more than twice the corresponding 1938 total. Although the public housing program is growing in importance, it is significant that the greatest contribution to the residential building gains was made by private enterprise. At the end of the first two months of this year private residential contracts amounted to $140,276,000, as compared with only $19,907,000 for public projects. The private residential total showed a gain of $65,561,000 over the first two months of last year as compared with a gain of $18,392,000 for public residential building.

The 1939 record of private residential construction reveals the fact that in the multiple-family-dwelling type, comprising many large-scale rental-housing projects insured by F.H.A., the cumulative dollar gain over last year at the end of February amounted to 176 per cent. For the same period, the dollar gain in the small-house field consisting of privately-owned one- and two-family residences amounted to 62 per cent.

Contemplated new residential building for February amounted to $169,854,000, a gain of 65 per cent. over the February, 1938 figure which amounted to $102,990,000. The cumulative record of contemplated residential projects for the first two months of this year was 42 per cent. ahead of the corresponding two months of last year.



The Portland-cement industry in February, 1939, produced 5,506,000 bbl., shipped 5,043,000 bbl. from the mills, and had in stock at the end of the month 24,080,000 bbl., according to the Bureau of Mines. Production and shipments in February, 1939, showed increases of 40.6 and 10.2 per cent. respectively, as compared with February, 1938.

Cement Shipments Up; Output Also Higher

The Portland-cement industry in January, 1939, produced 5,301,000 bbl., shipped 5,640,000 bbl. from the mills, and had in stock at the end of the month 23,615,000 bbl., according to the Bureau of Mines.

Production and shipments in January, 1939, showed increases of 16.9 and 28.5 per cent., respectively, as compared with January, 1938. Portland-cement stocks at mills were 5.6 per cent. lower than a year ago.

The factory value of the 1938 shipments from the mills, 106,524,000 bbl. is estimated as $154,433,000, representing an average value of $1.45 per bbl. According to the reports of producers the shipments totals for 1938 include approximately 3,413,000 bbls. of high-early-strength Portland cement with an estimated mill value of $6,316,000.

Penn-Dixie Earnings in 1938 Exceed 1937

Net profit for 1938 of $86,716 compared with $28,382 for 1937 is shown in an independent audit of the books of the Pennsylvania-Dixie Cement Corp. The profit equaled 71c. a share on 121,200 no-par shares of convertible preferred stock on which dividends in arrears on Dec. 15, 1938, amounted to $64.75 per share.

Current assets as of that date, including $3,320,409 in cash, amounted to $4,978,558. Current liabilities were shown at $461,616.

Mining of Pyrophyllite Experiences Revival

The mining of prophyllite talc has been revived in North Carolina to meet the increasing demand for talc in modern ceramics and plastics. Six nonmetallic mining companies are operating in the state at the present time, while ten years ago no more than one mine was being worked.

In obscure existence for more than 100 years, the non-metallic mining industry has profited enormously by recent developments in the field of plastics and ceramics. A million and a half ton bed in central North Carolina is the chief source of supply for the new talc. It is used for many types of ceramics, sheet asphalt and roofing, toilet preparations, crayons, pencils, battery boxes, and in the textile, soap and rubber industries.

Survey Reveals Mineral Deposits in Arkansas

A W.P.A. mineral survey sponsored by the Arkansas state geological survey has uncovered many important mineral deposits in Randolph County, Ark. The survey covered 548 sq. mi., and revealed paying quantities of kaolin, sandstone, limestone, dolomite and other materials.

Most of the rock of the upland regions of Randolph County is limestone and dolomite. A total of 39 good deposits, near the highways and railroads, have been located and are estimated to contain from 3,000 cu.yd. to more than 50,000 cu.yd. per deposit. The texture of the material makes some of it excellent building material, while much of it would make excellent fertilizer.

The survey located much gravel and sand in the western part of the county, in stream beds and in hilltop terrace deposits. The most important deposits commercially, however, were the kaolin deposits, found in the same locality. This material is being used now as a base for a boll-weevil eradicator.

Adds Another Batching Plant in San Francisco

Pacific Coast Aggregates, Inc., has started construction on a concrete-batching plant at 16th and Harrison Sts., San Francisco, to serve its growing ready-mixed-concrete business. The plant will cost about $50,000 with equipment, it is estimated.

Revise Standards for Coarse Aggregates

TWELVE SIZES ELIMINATED

According to an announcement of the Division of Simplified Practice of the National Bureau of Standards, the standing committee in charge of Recommendation R163-36, Coarse Aggregates (crushed stone, gravel, and slag), has approved a revision, and copies have been mailed to all interests for approval or comment.

This recommendation, which establishes recommended sizes for coarse aggregates, was first promulgated in 1936. At that time two groups of sizes, which overlapped and duplicated each other to some extent, were deemed necessary to meet different local requirements with the least possible change of the then current specifications.

The Joint Committee of the Mineral Aggregates Associations, in submitting that plan, recognized the undesirability of having two groups of sizes, but pointed out that when wide acceptance of the recommended sizes had been obtained, efforts could then be made to combine the two groups into one.

As a result of the experience gained over the period since 1936, the standing committee now recommends a revision comprising only one group. In addition, closer tolerances have been fixed for the lower limits of each of the coarse aggregates, a 5 per cent. limit having been placed on a size smaller than the nominal minimum to further control the amount of fine material. One size of aggregate was added to meet a growing demand for fine seal construction in the surface treatment of airports and for other surfaces requiring a fine seal material.

The consolidation of the two groups of sizes has resulted in a net elimination of 12 sizes.

Mimeographed copies of the proposed revision may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Mitchell to Replace Gautier on Board

Robert Mitchell, Consolidated Rock Products Co., Los Angeles, Cal., has been named to replace Frank Gautier of the same company on the board of directors of the National Sand & Gravel Assn.

Mr. Gautier informed the association that he was taking an extended vacation and that accordingly he was resigning from the board. He proposed Mr. Mitchell's name to fill the vacancy thus created and the association's board of directors, by letter ballot, unanimously approved the nomination.

Lone Star's Earnings Show $1.06 Decline

The report of the Lone Star Cement Corp. for the quarter ended December 31, 1938, shows net profit of $731,480, or 76 c. a share, against $949,198, or 99 c. a share in the December, 1937, quarter.

For the year 1938 net income was $3,060,436, or $3.18 a share, against $4,079,825, or $4.24 a share in 1937.

New Blast Furnace Is Blown in by Inland

A new blast furnace of the Inland Steel Co. at Indiana Harbor, Ind., near Chicago, has been blown in after two years of building and the investment of several million dollars.

When working at capacity, the new plant will consume daily, among other raw materials, 2,000 tons of iron ore from Upper Peninsula mines and 500 tons of limestone from the quarries of its subsidiary, the Inland Lime & Stone Co. of Manistique, Mich.

The city council of St. Paul, Minn., is considering an ordinance to compel owners of abandoned gravel pits within the city at least to partially refill and place them in a "sightly" condition.

Three Louisville Firms Sponsor Putty Plant

DELIVER READY-MIXED MORTAR

The Louisville Lime Mortar Co., Inc., of Louisville, Ky., now operating its Brooks-Taylor lime-putty plant, is jointly owned by the Southern Builders Supply Co., the American Builders Supply Co., and the Colonial Supply Co., Inc. The plant is located on the property of the American Builders Supply Co., at River Road and Jackson St.

Quicklime in calcium-pebble form is obtained from the Louisville Cement Co., being shipped to the lime-putty plant by trucks as needed. Local sand companies supply the fine river sand used for the mortar.

Lime is slaked at 180 deg. F., all the putty produced being used for brick mortar which is delivered in ready-mixed-concrete trucks owned by the three parent concerns.

The company has closed a contract to supply all the mortar on a huge slum-clearance project in Louisville. Deliveries will probably begin within the next couple of months.

Officers of the Louisville Lime Mortar Co. are: H. K. Williams Southern Builders Supply Co., president; B. H. Collings (Colonial Supply Co.), vice-president and secretary; and George R. Bickel (American Builders Supply Co.), treasurer.

Beyond the palm trees and the cylindrical light standards are the massive "elephant towers" flanking the Portals of the Pacific, the main entrance to the 1939 Golden Gate International Exposition. The towers are as high as a 12-story building. The exposition, which is now open, will continue throughout the summer and autumn.

Points Out 7 Flaws in Wage-and-Hour Act

OBJECTIVES ARE INCONSISTENT

Most of the difficulties now faced in the administration of wage-hour legislation are due to the fact that several inconsistent objectives are being pursued, John C. Gall, counsel, National Assn. of Manufacturers, recently told the annual meeting of the Pennsylvania State Chamber of Commerce at Harrisburg.

If administrative interpretations of the act are sustained by the courts, Mr. Gall asserted that important congressional changes in the act will be needed. He discussed seven points which, he said, the Congress "should consider and which no doubt it will be asked to consider".

These were:

"1. That there should be exempted from the overtime provisions of the law all office, clerical, supervisory and technical employees being paid on a full-time salary basis of over a certain amount. Obviously, if the purpose of the law is to protect the under-privileged, that can be accomplished without regulating the hours and overtime compensation of those receiving satisfactory compensation on a salary basis.

"2. The present law fixes a 44-hr. week maximum beyond which overtime rates must be paid. This has been interpreted by the Administrator, and no doubt properly in the light of the law's provisions, as preventing the averaging of work hours over a season or any period of more than one week. In other words, if an employee works 48 hr. in one week he must receive overtime for the extra 4 hr., although in the following week he may be required to work only 35 hr. Consideration should be given to the averaging of work hours over longer periods.

"3. The industry committees appointed under the Federal act are authorized to deal with minimum wages only. They have no authority over maximum hours. Neither is there any other provision in the law establishing a procedure for securing any general flexibility in the matter of maximum hours. Consideration should be given to broadening the activities of the industry committees so that they could also recommend tolerances and flexibility in hours unless the act is amended to specifically permit the averaging of hours.

"4. Consideration should be given to revision of the Federal act with respect to the number of hours that may be worked per week in future years without overtime pay. Under the present act the maximum for the current year is 44; during the second year it will be 42; and after that year it will be 40 hr. per week. It is questionable whether there is any necessity for fixing the maximum work week at less than 44 hr. It has a definite tendency to encourage decreases in employment and the substitution of technological improvements in order to avoid the payment of overtime wage rates. Impartial studies indicate that even on a 44-hr. basis we would not produce the goods necessary to sustain and improve our material standard of living. Certainly there can be no basis from the standpoint of health for reducing the maximum work week below 44 hr. This does not mean that industry should not voluntarily reduce hours below that figure, and as a matter of fact most major industries were already on a basis of somewhere around that figure before the Federal act went into effect. The average throughout industry was less but the extent to which that was necessitated by poor business conditions is difficult to estimate.

"5. There should be written into the act a congressional definition of the term 'regular rate' of pay and a clarification of Sec. 18 so as to make it clear that it was not the intention of the Congress to 'freeze' all wages and hours at the level in effect in October, 1938, irrespective of what the future may hold in store.

"6. There are in every industry and in most establishments certain employees who perform their duties off the premises of the employer and not under the immediate supervision of any superior. In these cases it is a physical impossibility for the employer to know what hours are worked except upon the information given him by the employee who performs the services. The act should be amended either so that such outside employees will be exempt or so that the employer will be protected if he has in good faith instructed such employees not to work beyond the maximum hours fixed by law, and can not be shown to have had knowledge that such employees did exceed the maximum permitted.

"7. The present law applies to employees engaged in commerce or in the production of goods for commerce. The statutory definition of 'production of goods for commerce' is so broad as to comprehend many activities which are not in facts acts of production. The definition should either be limited to the recognized meaning of production or the interpretation of the phrase should be left to the courts for determination."

Salesmen, Injured at Quarry, Ask Damages

SEEK $10,000 IN TWO SUITS

The Manegold Stone Co., Milwaukee, Wis., and its surety, the Liberty Mutual Insurance Co., are defendants in a suit for $7,500 filed last month by Paul Wendt, a Chicago machinery equipment salesman, who charged that he narrowly escaped death when he fell into a pit at the firm's quarry. His son, W. Maynard, in a separate suit, seeks $2,500.

The two allege they were inspecting a stone crusher last August 22, preparatory to installing a lubricator, when the father fell into the pit, landing on a conveyor belt leading to the stone crusher. He was unconscious and in danger of being drawn in the crusher, he claims, when his son rescued him, sustaining severe injuries in the attempt.

Recently erected for the manufacture of mineral wool, the plant of the Kentucky Stone Co. located near Mt. Vernon, Ky., was destroyed by fire a few weeks ago.

The loss was estimated to be in the neighborhood of $20,000.

Recent Equipment Installations ★ ★ ★

The William May Sand & Gravel Co., Fort Wayne, Ind., has purchased a new Model 40 Lorain power shovel. * * * *Vanderwerp recuperators are being installed on two of the 250-ft. kilns at the plant of the Glens Falls Portland Cement Co., Glens Falls, N. Y.* * * A double-deck 3-ft. by 10-ft. Symons screens has gone into service at the crushing plant of W. F. Culbert & Sons, Marion, Va.

A Day pulverizer has been installed at the Burns, Tenn., plant of the Jesse Allen Lime Co., Inc., Nashville, Tenn. * * * *A new Stearns Joltcrete machine has been ordered for spring installation by the Nashville Breeko Block & Tile Co., Nashville, Tenn.* * * A 75-hp. Diesel engine has been placed in service on a dredge owned by the Wilkey Gravel & Sand Co., Portageville, Mo.

A new ½-cu. yd. Osgood shovel has gone into operation at the Whitestone, Ga., quarry of the Willingham-Little Stone Co. of Atlanta. * * * *Two Cleveland wagon drills have been installed at the Lawton, Ky., quarry of the Green Bag Cement Co., of West Virginia.* * * Early this year the Rockydale Quarries Corp., Roanoke, Va., placed a 3-ft. Telsmith Gyrasphere crusher in operation.

Cummins Diesel engines have recently gone into service at the quarries of the Menifee Limestone Co., Inc., Princeton, Ky., and the Henry Moss Quarry, Georgetown, Ky. * * * *An Elliott boiler-feed water heater has just been installed in the Louisville Cement Co. power plant at Speed, Ind.* * * The Caldwell Stone Co., Danville, Ky., has just placed a 262-hp. Buckeye Diesel engine in service to supply power for one of its plants.

Consolidated Finishes Big Concrete Order

USED 2,000 CARS OF MATERIAL

Approximately 55,000 cu. yd. of concrete, which required 300 carloads of cement and 1,700 carloads of sand and gravel to produce, were mixed and delivered to the new Los Angeles Union Passenger Terminal by the ready-mixed-concrete division of Consolidated Rock Products Co. of Los Angeles.

The terminal, just completed, is built entirely of monolithic concrete. The Consolidated company set up a proportioning plant with ground-storage bins and cement-handling equipment at the building site. The design and control of the concrete mixtures was handled by the Raymond G. Osborne Laboratory, which also broke the test-cylinders poured on the job.

Individual pours on the job varied from a few cubic yards to a peak continuous pour of 1,128 cu. yd. which was completed in 16 hr. at an average rate of about 75 cu. yd. per hr.

For concrete designed for 2,000 to 2,500 lb. per sq. in. compressive strength at 28 days, a total of 1,650 cylinders showed a 2,932 lb. average. For 3,000-lb. concrete, 950 cylinders gave an average of 3,601 lb.

U. S. Reimburses Lofts for Damage to Plant

The United States Senate recently passed a bill introduced by Sen. McNary of Oregon, authorizing the U. S. Treasury Dept. to pay $33,500 to Lofts & Son, Hood River, Ore., for damage to their sand-and-gravel plant flooded by waters back of Bonneville Dam.

Lofts & Son had leased the land near the mouth of the river for many years from the Oregon Lumber Co. When the water back of the dam covered the land, the government's appraiser acquired the rights to it from the lumber company, and legislation was necessary to reimburse the Lofts concern.

Speedway Section Paved with Kentucky Asphalt

The back stretch of the Indianapolis Speedway, scene of the annual 500-mi. automobile race each Memorial Day, has recently been resurfaced with Kyrock, the product of the Kentucky Rock Asphalt Co., Inc.

The curves formerly were Kyrock-surfaced and Speedway officials are reported to be well satisfied with its performance.

Phoenix Company Adds Lime-Putty Department

The Sheffield Brick & Lime Co., Inc., of Phoenix, Ariz., has completed a new lime-putty plant at its works. It includes three brick tanks of 30 tons capacity each, in which the lime is slaked and aged.

Coming Events

April 7, 1939—Springfield, Ill. Annual meeting, Midwest Agricultural Limestone Institute, Abraham Lincoln Hotel.

May 24, 25, 26, 1939—Atlantic City, N. J. Fourth annual convention, National Industrial Sand Assn., Ambassador Hotel.

June 1, 2, 1939—Hot Springs, Va. Twenty-first annual convention, National Lime Assn., Homestead Hotel.

July 20, 1939—Rye, N. Y. Mid-summer meeting, Board of Directors, National Crushed Stone Assn., Westchester Country Club.

October 16-20, 1939—Atlantic City, N. J. National Safety Congress and Exposition.

To Spend $100,000 on Concrete-Pipe Plant

LOCATED AT ZANESVILLE, O.

Organization by a group of Columbus, O., men of the Zanesville Concrete Pipe Co., which will involve an initial outlay of about $100,000, was announced by Albert J. Rehl, president of a Columbus trucking concern.

The new corporation, with a capital structure of 250 shares of no-par common stock, was formed by Mr. Rehl, Herman I. Minkin and H. W. Thompson.

The new firm's announcement said that a 5-acre site and industrial plant have been acquired at Zanesville. Machinery for the production of concrete pipe in size from 12 to 60 in. is now being installed.

Asphalt-Road Program for Texas This Summer

An asphalt program to cost $1,773,205 will be carried out on 103 sections of Texas roads this summer, the Texas Highway Commission has announced.

Financed wholly by state funds, the program consists of application of permanent asphalt surfaces to sections of state highways on which base courses have been prepared for surfacing and of asphalt seal coats to sections previously surfaced and, due to weather and traffic conditions, in need of a thin application to seal cracks and voids.

Calaveras Studies Plan to Obtain Natural Gas

The Calaveras Cement Co. is conducting a survey to determine the feasibility of piping natural gas from the Rio Vista fields to its plant at San Andreas, Cal.

The company is considering serving a number of small communities in addition to its own needs if it goes ahead with the project, it is reported.

Illustrated are the sand dredge and plant of the All-Florida Sand & Gravel Co. near Interlachen, Fla. which went into operation in 1938. The dredge, while not pretentious, carries all the usual accessories including an intake hoist, a hydraulicking nozzle and a suction gauge. Two Model E-60 Allis-Chalmers distillate engines are used, one operating the dredge pump and the other a water pump supplying the jet. The plant consists of a gravity screen which removes twigs, bark, etc., and a Link-Belt dewatering cone from which the sand is loaded direct into gondola cars for shipment. A 60-ton car is loaded in from 40 to 60 min.

EDITORIAL

Public Confidence in Advertising

THERE is a growing belief among members of the advertising profession that something should be done about restoring the public's confidence in advertising. This belief has been expressed frequently in recent months and years, particularly when advertising specialists have gathered to consider what is good for the advertising business. Some of their criticisms have been frank and at times even bitter and tinged with an element of remorse, but this has not been considered improper because self-criticism, including the ability to see ourselves as others see us, is still counted a desirable quality. Advertisers can speak of themselves, their work, their ethics and their standards in terms that would bring down sharp rebukes if the criticism came from the outside. Within the advertising business are naturally included all those who make their living from advertising—those who have something to sell, those who prepare advertising material, those who own the media through which that material is distributed to the public, such as newspapers, magazines, bill boards, printing plants, radio stations, etc.—and those who serve the cause of advertising in less direct ways. All these have very definite and very tangible interests in advertising, and what advertisers do and how they do it are matters of deep concern to them.

As members of the advertising business we, too, have been aware of the waning of public confidence in advertising, and, on several occasions, we have commented on it. We have always believed, and we still believe, that the proper measures for the correction of the abuses of advertising opportunities should originate and be made effective within the field of advertising itself and should not be left to the attention of those who consider themselves the injured victims of those abuses. Had this been a more common belief among advertising men, we doubt whether public clamor and legislative attacks against advertising would ever have reached their present threatening proportions. As a result of this neglect to discipline itself from within advertising faces the immediate prospect of being policed from without.

This neglect may be due in part to the aloofness of the principals of large advertisers to the technique of advertising. It is one thing to pay for advertising in the perfunctory way in which business executives are accustomed to paying for most of the things their companies buy. It is quite another to exercise a critical and watchful supervision over their companies' advertising practice. Few executives have the time, the knowledge or the inclination to review every company activity with meticulous care. Advertising matters are commonly delegated to others who are employed for the supervision and control of advertising technique, and through this delegation of responsibility the problem is thought to be solved. The arrangement has failed for the obvious reason that those responsible for advertising practices have little or no understanding of the long-run interests of those who own and control business enterprise. Copy writers, script writers, commercial artists and others have approached their problem almost always with the short-range viewpoint of those who seek immediate results in order to justify the expenditures they propose. Their accomplishments are measured in terms of annually expiring contracts that must be renewed and they naturally employ methods and facilities that lend themselves best to the continuation of those contractual relations. The technique is one calculated to justify itself as it goes, and is not chosen with the view of proving its worth over a long period of time.

This difference of aims, this lack of understanding between business management and specialists in advertising technique, has led, according to Paul B. West, president of the Association of National Advertisers, "to abuse of advertising—blind driving ahead regardless of sign posts." "Too large a proportion of business management," he said further in the same speech before the Adcraft Club in Detroit last month, "knows little and cares less about the part advertising plays in the national economy. This ignorance leads to abuse which will eventually impair the efficiency of an essential tool of mass production and distribution. The danger lies not so much from without as within business itself."

THERE was a time when it was thought that the most glaring abuses of advertising could be localized in their effects, that if they had any unfavorable results in the way of a loss of public confidence these could be confined to the businesses of those who perpetrated the abuses. In a highly competitive economic system no practice, however original, can long remain the property or the specialty of one man or one company. Methods that are seen, or even only thought, to be effective in selling goods for one manufacturer are soon embraced by his competitors, who judge those methods solely by their effectiveness and make no

ethical appraisal of them. So what are at first only individual cases of abuse become more common under the spur of commercial rivalry. Bad practices spread from one advertiser to another, from one kind of product to another, from one industry to another. Even the field of industrial advertising, which for a long time provided only occasional examples of fraudulent or deceptive advertising, is responding to the pressure of conformity and is adopting more widely the methods that have been condemned by specialists within the field of consumer-goods advertising. It is, therefore, neither logical nor safe to assume that the nationwide protest against advertising will leave unnoticed or untouched the advertising of the capital-goods industries.

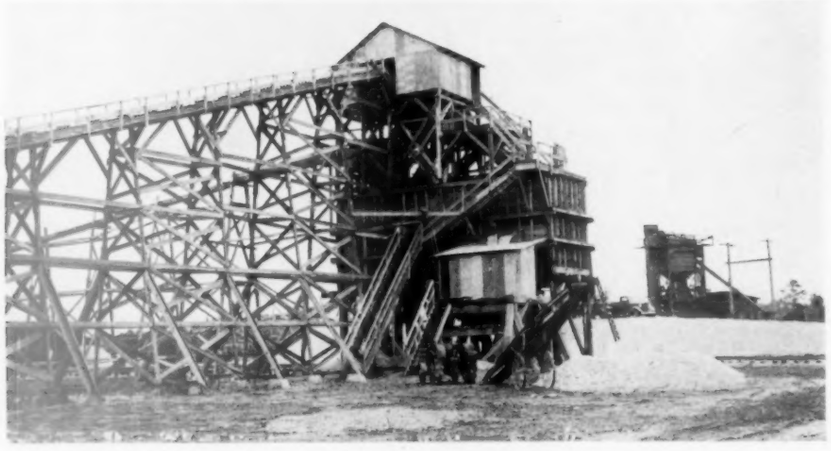
A RECENT announcement of policy by the Federal Trade Commission makes it clear that the problem of the manufacturer's responsibility for the ethical soundness of his advertising is in an acute stage. The commission is determined to fix the liability for fraudulent and deceptive advertising and to that end is asking advertising specialists to state the nature of their relations to their clients with respect to the preparation and placing of advertising copy. According to P. B. Morehouse, chief of the Radio and Periodical Division of the commission, the Wheeler-Lea law "makes the dissemination or the causing of the dissemination of false or misleading advertising for foods, drugs, cosmetic and devices unlawful." Even copy writers, although exempt from the criminal penalties provided by the law, are clearly liable for civil penalties if they violate the law. The civil penalties will be applied against offending manufacturers (advertisers) or advertising agencies if either is solely responsible for the unlawful copy, or against both jointly if they are both responsible.

Meanwhile the public clamor against dishonest advertising continues. In addition to the existing Federal law against fraudulent advertising, scores of bills directed against advertising have been introduced in various state legislatures. But probably most threatening of all is the attitude of consumers' organizations, women's clubs, civic bodies, schools and universities, and a rapidly growing volume of literature on the subject. One student of the problem has estimated that no fewer than 10,000,000 women are, as he has said, "in the direct path of the influence of the anti-advertising movement." Of these, 2,000,000 are members of the National Congress of Parents and Teachers; others belong to the American Association of University Women, the National Council of Jewish Women, the American Nurses Association, the National Federation of Business and Professional Women's Clubs, the Federal Council of the Churches of Christ in America, the National Council of Catholic Women, and many similar organizations. To these must be added the millions of men who belong to labor unions and consumers' bodies.

Many of these organizations discuss the problems of buying and the nature and influence of advertising in their meetings; many of them distribute leaflets warning buyers against certain types of spurious claims made by some advertisers. Books devoted to fraudulent advertising in various fields have been purchased in large numbers. *Your Money's Worth, 100,000,000 Guinea Pigs, Skin Deep, Facts and Frauds in Woman's Hygiene, Guinea Pigs No More,* and other books have been bought by the hundreds of thousands; one of these went through fifteen printings in the first year of its publication. These books and the reports of many of the organizations named do not deal in academic generalities; they publish the record in detail with names, dates and all the essential facts; they quote government bureau reports and the findings of the Federal Trade Commission. The evidence they present has built up a mistrust on the part of large sections of the public that can not be laughed off or dismissed with a wave of the hand. A realization of the extent and importance of this movement of "consumer education" seems to be reaching the innermost circles of the advertising business itself, as the addresses of numerous advertising men in recent years sufficiently indicate.

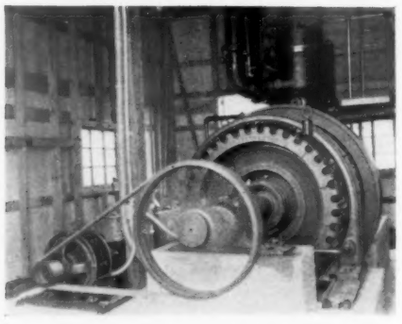
THERE can no longer be any doubt that advertising is on trial, those who use it and those who distribute it. Yet it still has an opportunity to discipline itself, to exercise within its own circle and through its own members the control that present and proposed legislation threatens to take away. It is not enough to believe and assert that fraudulent advertisers are in the minority, that the cases that come to the public's notice are rare exceptions, that the methods complained of are not used by the biggest and most reputable advertisers. The truth or falsity of those statements is immaterial as long as the public views with suspicious eyes the advertising of all advertisers. Would-be buyers hold back in hesitation out of a fear of being tricked, and the innocent advertiser suffers even more than the guilty one. Copy writers are finding it increasingly difficult to find slogans, to invent phrases that win conviction among skeptical buyers.

The best way, in our judgment, to restore public confidence in advertising is to make all advertising truthful. It can not be done by orating in glowing terms about what advertising has done to spread the use of luxuries, to lower the cost of the necessaries of life. Even those pleas are rejected with scorn by those among whom advertising has lost caste. When all advertising begins to show the effects of a well-intended and a carefully-supervised internal discipline, its messages will begin to be received with the credence which its writers and distributors feel they deserve.



The new plant with main conveyor at left. Part of the product is used in the asphalt plant in the background.

LEFT: The crawler drag-line loading into side-dump cars. BELOW: Sand and gravel being dumped from cars into plant hopper.



The 120-hp. Diesel engine and alternator which supply power for the new plant

The crusher used for reducing gravel stored in the plant bins.

Gravel Plant Generates Own Power with 120-Hp. Diesel

By W. E. TRAUFFER

THE Tuskegee Sand & Gravel Co., a new company headed by experienced gravel producers, early in March, 1938, put in operation a modern new sand-and-gravel plant near Tuskegee, Ala. Several months later the Tuskegee Asphalt Corp. erected a Warren Bros. aggregates-bituminizing plant on the same property. When the latter plant is operating it uses about 800 tons of aggregates daily. The sand-and-gravel plant has a capacity of over 100 tons per hr. and was designed by the Smith Engineering Works, which supplied most of the equipment.

The company holds about 600 acres of land, most of which carries gravel. The overburden varies up to several feet in depth and there are some trees and shrubs to be removed. Excavation was begun along the edge of a creek, which is said to have deposited the sand and gravel. The sand content varies from 50 to 70 per cent. in places. About 10 per cent. of the gravel is over 1 in. in size.

A Northwest crawler drag-line loads the sand and gravel into 5-cu. yd. Western side dump cars. This crane is powered by a Climax gasoline engine and has a ¾-cu. yd. Page drag-line bucket. A Plymouth 12-ton locomotive with a Climax gasoline engine hauls these cars in two trains of 3 cars each. A switch-track at the loading point makes it possible to load one train while the other is being hauled to the plant, a distance of about 1,000 ft.

At the plant the material is discharged from the cars on an earth fill into an 18-cu. yd. wooden hopper. A Telsmith reciprocating feeder discharges the material on a 192-ft. inclined belt-conveyor operating on an 18-deg. slope. Telsmith-Alemite idlers and Robins belting are used. The material is discharged on a 4-ft. by 12-ft. Telsmith Pulsator screen which has 4 decks. Usually wire cloth with 1-in., ⅝-in., and ½-in. openings is used on the first three decks. No. 1 and 2 sand screens are used simultaneously on the bottom deck, when making concrete sand. When making fine sand, the 18-in. section of coarse sand screen is

blocked off and the coarse sand retained on it is flumed to waste. The four sizes of gravel retained on these screens are oversize, 1-in., ⅜-in., and pea gravel. These are discharged direct into bins.

The sand passing through the bottom deck of the screen can be discharged into a Telsmith sand-settling tank, from which it is discharged into a bin. The sand can also be run from the screen through a flume in which there are three settling boxes. This sand is discharged into stock-piles at the aggregates-bituminizing plant.

The wooden bin structure has six compartments with a total capacity of 400 tons. Cars or trucks can be loaded with sand through either side or bottom gates and with gravel through side gates only. The cars are "spotted" for loading on a gravity track.

The oversize gravel can be discharged from its bin through a side

The vibrating screen which does all of the gravel sizing for this plant.

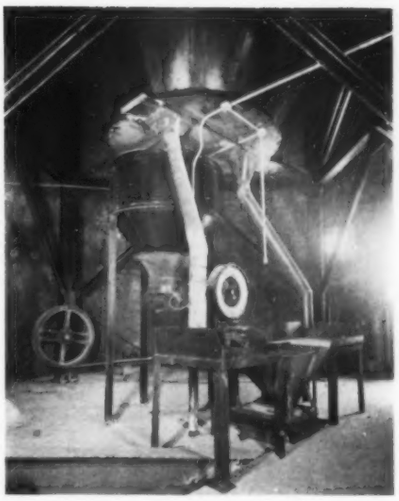
chute into a Telsmith 32 B gyratory reduction crusher. The crushed gravel can be discharged into a small wooden bin for truck-loading or on a Link-Belt portable conveyor for car-loading. Trucks are loaded under the bin either for shipment or to return the crushed gravel into the plant hopper for recirculation through the plant along with the raw feed.

The gravel plant has been producing 1,200 tons in a 12-hr. day. When the asphalt plant is operating, it requires up to 800 tons of aggregates daily, as has been said. Most of the gravel in excess of the asphalt plant's needs is used for concrete bridges, paving, etc., much of which remains to be done in this section of Alabama.

All the equipment in this plant is electrically-driven. The main belt-conveyor is driven by a 15-hp. Sterling gearmotor and chain, and drives the feeder from its tail pulley. The vibrating screen is driven through V-belts and the crusher is similarly driven by a 50-hp. motor.

Power is supplied at 240 v. by a Fairbanks-Morse Type TGZO 76.8-kw., 3-phase, 60-cycle alternator direct-driven by a 2-cyl., 120-hp., Fairbanks-Morse Model 32E12 Diesel engine. This engine is equipped with a Purolator and water-temperature indicators. A small gasoline air-compressor supplies starting air. This engine also drives a 5-kw. exciter through a V-belt, and a cooling-water pump through a flat belt. The Fairbanks-Morse control board has Roller-Smith Co. voltmeters and ammeters, as well as switches, and a voltage regulator for the alternator.

The officers of the Tuskegee Sand & Gravel Co. are: W. G. Mitchell, president; W. M. Blount, vice-president and general manager; R. H. Powell, Jr., secretary and treasurer. Mr. Blount is also president of the Tuskegee Asphalt Corp. C. B. Smith is superintendent of the sand-and-gravel plant.



Cement vibrating feeder and spouts from lime and limestone bins which feed to scale for batch weighing, or direct to screw-conveyor at left for continuous feed.

Highways in the construction of buildings at the new Sarnia-Port Huron international bridge.

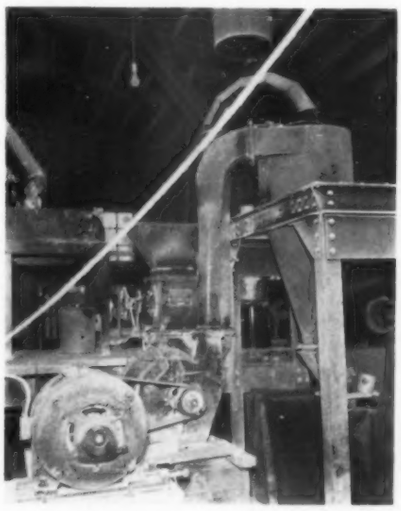
The outstanding product of this plant is Medusa White Portland Cement, which is used for concrete structures, cast stone, stucco, swimming pools, or other work where this color is desired. Waterproofed White Portland Cement has all the other properties of the White Portland cement and is used wherever maximum resistance to moisture is required. The Waterproofing Powder used in this cement is also produced in this plant and is sold separately to be mixed into concrete at the job. The fourth product is a non-staining waterproofed Stone and Mortar Cement.

Medusa Portland Cement Paint is made in white or a wide range of colors. This paint is used in painting

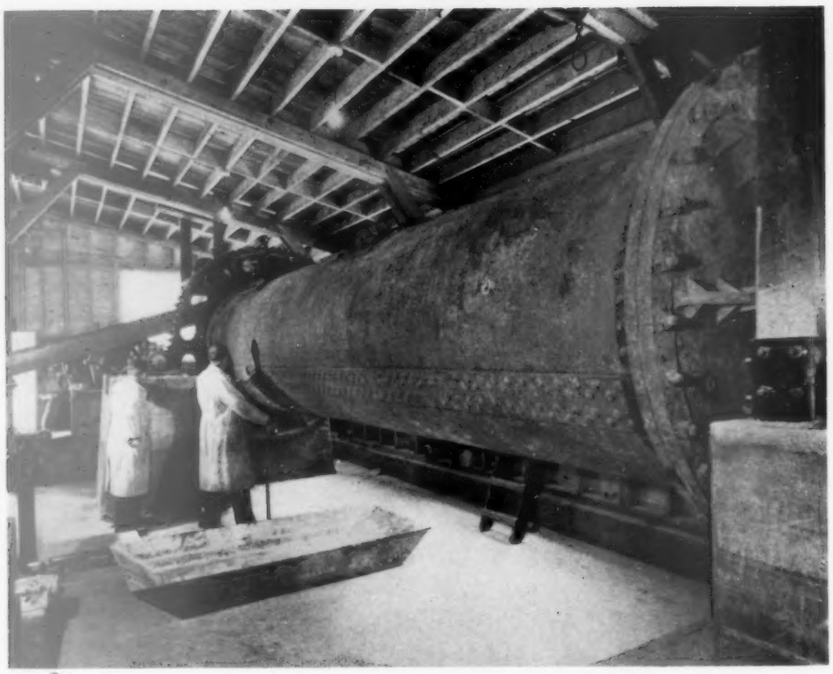
Medusa of Canada Opens Small Plant for Special Cements

Plant of Medusa Products Co. of Canada, Ltd.

THE Medusa Products Co. of Canada, Ltd., in June, 1938, put in operation a new plant at Paris, Ontario, for the manufacture of white Portland cement, waterproof white cement, white masonry cement, cement points, etc. White cement clinker from the plant of the Medusa Portland Cement Co. at York, Pa., is used. These products are being sold in competition with English and Belgian white cements, which formerly had a virtual monopoly of this business. It is interesting to note that the first shipment of white Portland cement from this plant was used by the Ontario Dept. of



The pulverizer and cyclone used to make waterproof powder and cement.



The tube-mill which grinds clinker and other ingredients for standard white, waterproof and masonry cements.

brick, concrete or masonry walls, stucco, etc. Medusa-Lite paint is used for painting interior walls and ceilings. This is a casein paint obtainable in pastel colors. The last of the seven products is Medusa Floor Coating, which gives interior concrete floors a colored surface that resists abrasion, water and alkali.

The white cement clinker is received in bulk-cement cars and is discharged into a hopper, from which a screw-conveyor and elevator feed it to two compartments of a 4-compartment storage bin. The same system is used for unloading lime and limestone dust, which are stored in the other two bin compartments.

When standard white cement is being made the clinker is discharged from storage by means of a Jeffrey-Traylor vibrating feeder controlled by a mercoid switch and a rheostat. This clinker is discharged into a hopper from which a screw-conveyor feeds it into the 5-ft. by 22-ft. tube-mill.

When making waterproof or masonry cements this hopper, which is mounted on a Toledo dial scale, is used as a weighing batcher. The limestone and lime are withdrawn from storage through spouts on two tables, one on each side of the batcher. The desired amounts of these materials are then added in the batcher from the tables. Both lime and limestone dust are added to the clinker when making masonry cement and lime and waterproofing powder are added for waterproof cement. The same screw-conveyor carries these mixtures to the tube-mill.

These cements are ground in the tube-mill to a fineness of from 90 to 93 per cent. through 200-mesh. The product of the mill is discharged on a small Tyler Hum-mer screen with 20-mesh openings which wastes the small amount of oversize material. The material passing through the screen is elevated to a screw-conveyor feeding any of three bins over three 2-bag packers. Each set of bins and packers is reserved for one of the three types of cement produced.

White cement paint is made by discharging white cement from its storage bin into a Raymond separator from which the rejects are returned to the clinker-storage bin. The product of the separator, 95 per cent. through 300-mesh, is fed to an Abbe ball-mill in which the other ingredients are ground and mixed. Colored cement paints are made in the same way by adding the desired colors in the Abbe mill. The cement paints are packed by hand into 10-lb. and 50-lb. bags.

Electric vibrating screen which removes coarse particles from mill product before going to elevator at left.

Waterproof cement is made by adding a waterproof powder, consisting essentially of lime and stearic acid, to white cement. These materials are weighed and batched into a small Raymond pulverizer which operates in closed circuit with a cyclone. The product, which is practically 100 per cent. through 300-mesh, is discharged from the cyclone through a spout into bags.

This plant can produce 300 bbl. of cement in 24 hr. Provisions have also been made for future expansion of both productive and storage capacities. The plant is on a siding of a main line of the Canadian National Rwy.

The Medusa Products Co. of Canada, Ltd., is a branch of the Medusa Portland Cement Co. of Cleveland, O. The managing director of this new enterprise is J. F. Cameron, who for many years has been prominent in the building-supplies industries in Canada. Under his direction a Dominion-wide sales and advertising program is being put into effect.

Find Strontium Deposits in Northern Ohio Area

It has been disclosed by Wilber Stout, Ohio state geologist, that large deposits of rare strontium sulphate have been found in the area between Fremont, O., and Toledo, O., and on Lake Erie islands.

Strontium sulphate is a metallic compound which produces red fire and which is an important element in some manufacturing processes of the sugar industry. There are many other uses. Up to this time it has been imported from England, the state geologist said, at costs ranging from $40 to $80 a ton. He declared it can be produced in northern Ohio for far below that amount.

Dr. Clarence R. Rex, research director of the Woodville Lime Products Co., Toledo, O., says that the strontium has been found in the Fremont-Toledo area on properties of his and other companies. He said the situation is being carefully investigated. "If we run into a real vein of it, it would be like running into a vein of gold," Dr. Rex reports.

Mr. Stout reports many of the northern Ohio quarrying concerns are investigating the advisability of producing the material for commercial purposes and are looking the area over carefully for rich supplies of it.

Technical Developments in Industrial Minerals Revealed at AIMME Meeting

THE Industrial Minerals Division of the American Institute of Mining and Metallurgical Engineers, under the able chairmanship of J. R. Thoenen, presented an interesting program as part of the annual meeting of the institute held in New York, February 13 to 16. Papers on milling methods and the geology of nonmetals predominated, but others of a more general nature also were included in the three technical sessions of the division. At the business meeting Dr. M. M. Leighton, chief, Illinois Geological Survey Division, was elected chairman to succeed J. R. Thoenen of the Bureau of Mines. Frank Reed, chief chemist, Illinois State Geological Survey, replaced Alden H. Emery, assistant manager, American Chemical Society, as secretary-treasurer of the division. It was announced that a regional meeting would be held in Alabama in the fall of 1939 and another in Illinois in 1940.

At a joint session with the Milling Methods Committee of the institute T. B. Counselman, of the Dorr Co., stressed the advantage of close control of cement-kiln feed through the proper use of classifiers and closed-circuit grinding as practiced at the plant at Leeds, Ala. R. A. Kinzie, Jr., of the Santa Cruz Portland Cement Co., described the use of a Raymond mill to pulverize gypsum before its addition to the cement clinker in the Hardinge mill. He reported that this procedure had proved highly satisfactory at the plant of his company.

J. E. Norman, Jr. and Oliver C. Ralston, of the U. S. Bureau of Mines, reported the results of tests conducted at College Park Md., on conditioning surfaces for froth flotation. These experiments have shown that with many materials far better flotation results can be obtained if the pulp is given special treatment before entering the cells. Mr. Norman stated that the cost of such supplementary treatment is not unduly high. It is understood that a new application of electrostatic separation, which was to have been described by B. C. Burgess, Tennessee Mineral Products Corp., also involves a procedure to condition the surface of the material to be treated. Mr. Burgess promised to have full details available for an early meeting of the Industrial Minerals Division.

A joint session with the Mineral Geology Committee and Society of Economic Geologists dealt largely with the geological occurrence of diatomite, barite, and vanadium minerals. Most of the papers presented during the New York meeting are not available for distribution but those listed in footnote references in this article may be procurred by nonmembers of the institute for a small charge by writing the American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York, N. Y.

Preheaters for Rotary Kilns.—T. C. Tayler, of the Belle Isle Lime Co., discussed preheaters for rotary kilns, particularly the equipment designed by him now in use at the plant of the Belle Isle company. He introduced his paper by pointing out the inefficiencies of rotary kilns and described briefly several methods of preheating; these included the Lepol chain grate; a cylindrical-drum device developed in England; heating the pipe coils of Fuller-Kinyon systems by stack gasses; as well as increased kiln lengths and the use of chains, lifters, and similar aids to increased fuel efficiency. Mr. Tayler stated that the results with longer kilns in the lime industry have not been as outstanding as in the manufacture of cement, but he added that the new plant of H. E. Millard at Annville had proved quite satisfactory.

The preheater in use by the Belle Isle Lime Co. is fed at the top with the stone moving downward and outward. The hot gasses enter from below and move upward and inward through the charge. The preheated stone drops into a soaking chamber, whence it is carried to the kiln. This preheater was designed for operation of the rotary kiln at 250 per cent. of its capacity. Actual operation, despite difficulties besetting a new installation, has been at more than 150 per cent. of capacity. The speed of the kiln has been increased 50 per cent. The fuel ratio is 4 to 1; it would probably be about 2.7 to 1 without the preheater. The saving in fuel amounts to about 5 tons daily, nearly $15. This saving, of course, has to be balanced against higher power costs, but the balance is favorable.

This type of preheater presents no particular problem in construction or installation for it operates as a supplementary piece of equipment that can be added to any plant using a rotary kiln without material rearrangement of the present flow sheet.

The advantages of the preheater are its high efficiency, large capacity, low capital cost, and the fact that it can be easily adapted to present equipment. Among the disadvantages are the necessity for careful sizing and uniformity of the stone to be charged, the education of the personnel to the proper use of the preheater, and the problem of dust, although dust can be removed satisfactorily by screening between the preheater and the kiln. Mr. Tayler was very emphatic in his conclusion that the proper use of preheaters and coolers in lime plants will aid efficiency and reduce costs.

Calcination Conditions.—John E. Conley of the Bureau of Mines reported [1] the results of experiments on calcination conditions for limestone, dolomite and magnesite.

Carefully prepared regular cylindrical specimens of limestone and crushed and sized samples of limestone, dolomite and magnesite were calcined under carefully controlled temperatures and at carbon-dioxide pressures of one atmosphere. Dissociation temperatures under these conditions were indicated as approximately 900 deg. C. for high-calcium limestones and 725 and 620 deg. C. for dolomite and magnesite, respectively.

The calcination of cylindrical specimens of stone proceeds at a fairly uniform rate directly proportional to the exposed surface and to the temperature, although the rate is slightly less than theoretical. Cross sections of partly calcined specimens of high-calcium limestone show that the sharp corners of the original piece become well rounded as the calcined zone progresses into the solid. Certain points, along stratification planes and near fractures, show a slightly faster selective calcination than the main dissociating surface. The rate of calcination, which has been defined as the rate of penetration of the decarbonated zone, may be deduced to vary but slightly from a linear function of surface temperature in the range 900 to 1,135 deg. C. at atmospheric pressure of carbon dioxide.

Mr. Conley cautioned that the data obtained in these experiments were collected on specific limestones and that

[1] Conley (John E.), *Calcination Conditions for Limestone, Dolomite and Magnesite.* A. I. M. M. E. Tech. Pub. No. 1037, 1939, 15 pp.

similar information should be obtained on other types before extensive attempts to apply these results are made.

Tennessee Phosphate Industry.—Paul M. Tyler [2] of the Bureau of Mines reviewed recent developments in the Tennessee phosphate industry. He reported that better technology has been the means not only of expanding but of continuing phosphate production in Tennessee. Deposits rich enough in plate rock to be worked by old-time methods have long been exhausted, and for many years the proportion of fine concentrate has been much greater in Tennessee than in other phosphate fields. Year after year, as the more easily and cheaply mined deposits have been worked out, the average ratio of overburden to muck thickness has tended to increase and the physical conditions of mining have grown more difficult. Mechanization has not progressed as fast in Tennessee as in Florida, but the output per man per year rose in 1937 to 575 tons compared with 543 tons in 1929 and 312 tons in 1919. In 1909 it was 207 tons, a substantial drop from 271 tons in 1902, thus marking the diminishing output by hand mining following the exhaustion of

Alden H. Emery, American Chemical Society, retiring secretary of the Division.

easily worked blue-rock and rich brown-rock deposits and before the expansion in mechanical methods got well under way.

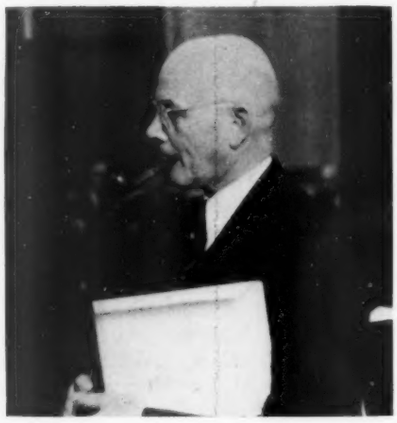
It is unfair to compare operations in Tennessee with those in Florida. In Florida costs are lower and the output per man is about three times as high as in Tennessee, but in Tennessee mining conditions are more difficult and so much larger a proportion of rock is recovered in fine sizes that more treatment is required. In 1937 Tennessee, though furnishing only 22.1 per cent. of the total national output, employed 41.6 per cent. of all the workers in the phosphate industry in the United States.

According to Mr. Tyler, better recoveries have been quite as important as improved mechanical equipment. Of first importance is the progressive recovery of finer and finer sands by better settling, later supplemented by flotation, and finally the increasing utilization of unwashed or only partly washed matrix by furnace processes. Details in the concentrating department include finer screens, better mechanical classifiers, and better settling equipment, together with the placing of important machines in tandem so as to make their work more effective. Mechanically, too, the washers are better designed, and hand labor is being reduced by more conveying, elevating, and pumping equipment. Inasmuch as most of the mills have been remodeled instead of rebuilt, they do not have the immaculate appearance of modern design, but they are much improved from the standpoints of both efficiency and safety of the workers. Economies in the drying step have been attained

Oliver Bowles, a former chairman, and J. R. Thoenen, retiring chairman of the Division.

mainly in mechanical stoking and, where possible, through the use of larger units, combined with more attention to handling the rock into and out of the shell. More attention to mechanical control and uniform operation combined with grading and blending facilities—aided at some plants by the possibility of making high-grade flotation concentrates "for sweetening"—has resulted in the production of more uniform products and a better ability to cater to the needs of discriminating buyers. The increasing sale of sands and muck containing under 60 per cent. B.P.L. is a further factor, not only broadening the range of products that can be sold but actually helping to increase the proportion of high-grade concentrates that bring the highest prices. Out of this may come a well-defined tendency to eliminate middle grades and to produce for the general chemical market and acidulating plants high-grade rock carrying well over 73 per cent. B.P.L., using the remainder of the washed sands to blend with unwashed matrix for use in making furnace sinter. If the demand for sinter grows sufficiently, such a trend would mean bigger profits for operating companies and better conservation of a valuable national resource in this region, whose location makes the somewhat limited reserves of extraordinary economic value.

Apart from the displacement of hand by machine excavation, technologic change has had less effect on mining operations than on washing. Most deposits either are too small or have not sufficiently favorable bed-rock conditions to make possible the use of



M. M. Leighton, Illinois State Geologist, newly-elected chairman of the Industrial Minerals Division.

much larger equipment with the accompanying economies that have been gained elsewhere. Even a 4-cu. yd. bucket may be too large and at some pits a 1½-cu. yd. bucket may be more economical because it is so much more flexible, gets down into the cutters and into crevices in the horses, and so reduces hand shoveling.

Progress in mechanization can be measured by the yardstick of power equipment. In 1902 the total of all prime movers installed was 1,410 hp. By 1919 it had jumped to 7,070 hp. In 1929 it declined slightly, to 6,639 hp., but meanwhile the horsepower of electric motors operated on purchased power had jumped from none in 1902 to 5,172. The total power installation increased from 7,168 hp. in 1919 to 11,811 hp. in 1929. Subsequently, further large increases have occurred, and, while steam or Diesel power is still used on shovels and for hauling from the mines, individual power-plants have been abandoned because cheap electric power now is available everywhere for purchase. Per wage earner employed the installed horsepower has grown from 4.61 in 1919 to 9.57 in 1929, more than doubling in 10 yr.

Costs naturally vary widely at different plants and at different seasons of the year. Assuming regular operation of a well-equipped mine with 10 ft. of overburden and 10 ft. of proved muck, the minimum direct or operating cost per long ton of product, averaging, say,

[2] Tyler (Paul M.), *Recent Developments in the Tennessee Phosphate Industry.* A. I. M. M. E. Tech. Pub. No. 1053, 1939, 22 pp.

73 per cent. B.P.L., might work out about as follows:

	Per Long Dry Ton
Stripping (1½ tons @ 20c.)	$0.30
Mining (1½ tons @ 24c.)	.35
Transport to washer (1½ tons @ 20c.)	.30
Washing (1½ tons @ 50c.)	.75
Drying	.50
Storing and handling	.10
Depletion	.50
	$2.80

Probably few commercial operations in Tennessee can equal this estimate for more than brief periods, owing partly to occasional shutdowns and partly to additional charges to cover prospecting, obsolescence, general office overhead, and financing.

Technical Progress.—As in previous years the review of technical progress in industrial minerals by Oliver Bowles of the Bureau of Mines was a feature of the meeting. Dr. Bowles reported that one of the most remarkable developments is the utilization of the ocean itself as a source of mineral wealth. Long ago salt was obtained from sea water and potash from kelp. Recently a plant was built at Wilmington, N. C., to extract bromine from sea water, and the latest enterprises seeking mineral products from this least exhaustible source of supply comprise two large chemical plants on the Pacific Coast, one of which recovers from sea water raw materials that will produce daily 60 tons of magnesium salts. The chemical salts, refractories, and oxychloride cement thus produced were formerly obtained largely from magnesite or brucite. The future effect of these processes on the magnesite in-

W. M. Weigel, Missouri-Pacific R. R., S. H. Dolbear, former Division chairman, and J. E. Conley, Bureau of Mines.

dustry of the West or possibly on the dolomite industry of the East will be watched with interest.

Striking progress has been made in concentrating nonmetallic minerals by agglomeration and tabling. Cationic filming agents are now used for separation of quartz and feldspar at Keene, N. H. Graphic granite, consisting essentially of intergrown albite and quartz, a rock that was formerly discarded as waste, is now treated by tabling to obtain a feldspar containing only 2 per cent. quartz, and a quartz concentrate 99.3 to 99.4 per cent. pure.

Improvements in milling processes are making possible more effective concentration of industrial minerals, are improving the quality of products, and are, in effect, increasing enormously the reserves of raw materials, because low-grade materials, formerly regarded as useless, can now be utilized economically. Such improvements relate particularly to phosphate rock, barite, clay and feldspar.

Many nonmetallic-mineral industries are in a constant state of unrest because of the encroachment of competing materials upon their markets. Inventive genius is directed continually toward developing new uses for minerals and rocks, or in changing the character and quality of products to adapt them to changing conditions. Consuming industries frequently change their specifications, modify their products or make new products; therefore, they demand new or modified raw materials. It is imperative, therefore, that producers of industrial minerals keep abreast of all new developments in order that they may maintain or increase their markets. Feldspar, for instance, is confronted with competition from nepheline syenite, and from a high-alumina rock known as aplite; fullers' earth is now sharing its market with bauxite and acid-treated bentonite; and olivine, kyanite, natural sandstone, and molded furnace linings are competing with magnesite, chrome, silica brick, firebrick, and bauxite refractories. Mica is usually regarded as a mineral for which there is no substitute for high-tension electrical insulation, but certain fractions now separable from bentonite can be made into films said to be satisfactory substitutes for mica.

The "electric ear" developed by the Hardinge Co. is finding practical use in milling industrial minerals. The Eastern Magnesia Talc Co. of Johnson, Vt., utilizes the louder noise that ensues when a ball-mill operates with a small load to actuate an "electric ear" which controls the feed.

Froth flotation for preparation of cement raw materials has been employed for several years at Valley Forge, Pa.,

Paul M. Tyler, Bureau of Mines, and J. E. Lamar, Illinois Geological Survey.

and is now being extended to the Lehigh Valley cement area. It is in use also at one cement plant in the Union of South Africa, and one at Paraná, Argentina.[3]

According to Dr. Bowles, one of the most striking events of the year was the extraordinary upward revision of the estimated reserves of phosphate rock in Florida. Threats of curtailment of exports, the most profitable part of the business, in order to conserve resources, brought in a deluge of data indicating that reserves were from 2½ to 3 billion tons. Not only are there enormous reserves in the bed rock, but improved milling and new methods of extraction have the effect of increasing greatly the reserves of pebble rock which is now utilized in part. For instance, two plants in the Tennessee district are now extracting elemental phosphorus from muck and sand too low in grade for economic use by the older methods.

In the field of refractories moderate progress has been made in the use of olivine and kyanite, in a wider use of natural sandstone for furnace linings, and in the use of refractory cements for monolithic linings.

The usual flock of new mineral-wool plants could be enumerated, and increased activity is to be noted in the manufacture of light-weight aggregates, such as Pottsco, Waylite, and Haydite. The Pottsco process of making porous slag aggregates has been acquired by the Celotex Corp., and expansion is to be expected.

A year ago mention was made of a new process employed in Australia for recovering CO_2 from lime kilns by absorption with potassium carbonate. This process is now used by the Alabaster Lime Co., Siluria, Ala., for recovery of 15 tons of CO_2 daily.

A new shaft-kiln design with a center burner for distributing fuel gas throughout the charge now makes it possible to burn limestone spalls into lime successfully. This marks an important step of progress in the lime industry, because the ordinary shaft kiln uses no stone smaller than 4-in., which results in a great waste of stone in small sizes. Small-sized limestone may be burned in a rotary kiln, but this equipment is costly and generally has low fuel efficiency.

Talc is finding wider use in ceramics. In 1931 only 1 per cent. of the talc sold in the United States was applied to such use, in 1937 the percentage had increased to 13.

[3] Posselt (E.) and Trauffer (W. E.). *Design of New South American Cement Plant Takes Full Advantage of Breerwood Process of Flotation.* Pit and Quarry, Nov. 1938, pp. 40-51. *Minerals-separation Process Used at Lone Star's New Argentina Plant, ibid.*, pp. 52-56.

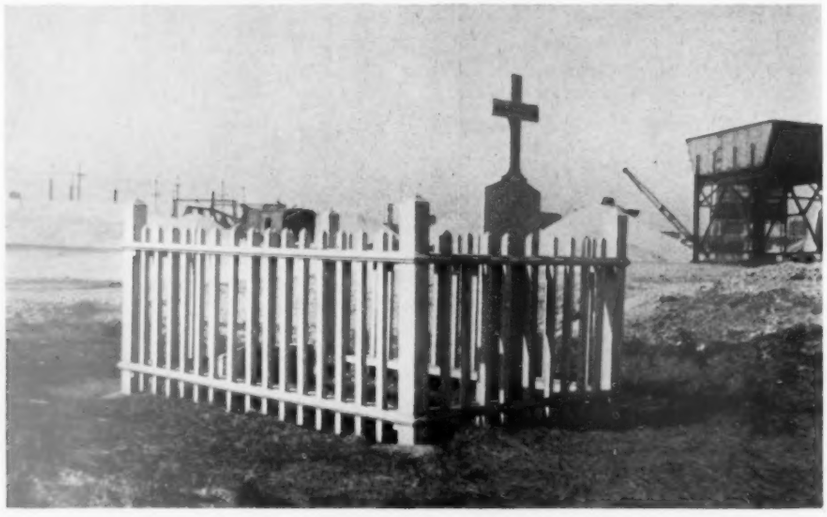
The potash industry has been developed to the point where we can now say truthfully that the United States could, in an emergency, be entirely independent of foreign sources.

The year 1938 has been characterized by technical improvements in many branches of the industrial-mineral industries, by the keen competition of minerals that may be substituted one for another, by a better utilization of waste, and by the extension of products into new fields of usefulness.

Silicosis.—At an interesting session of the Committee on Health and Safety in Mines R. R. Sayers, U. S. Public Health Service, presented a summary of information on silicosis. Dr. Sayers pointed out that acute silicosis is an unfortunate designation, for the disease is serious in all stages. Silicosis occurs among coal miners when there is free silica in the dust, and the minimum percentage of silica resulting in a harmful condition has not been determined. It is quite evident that other dusts may be harmful, particularly when mixed with silica. Methods for the early diagnosis of silicosis need further study, and it is particularly important to remove persons in the early stages of silicosis from further exposure. Examinations should always be carried out by special trained medical personnel with proper X-ray equipment.

Dust-investigation methods should be standardized, although methods may vary in different countries. A determination of the number of particles per cubic centimeter is desirable for a better coördination of the data. Ultramicroscopic particles do not seem to be of great significance and the present methods of determining the dust count are apparently satisfactory. However, methods of determining the amount of free silica in the dust are important and further research on X-ray analysis is needed. Additional biological experimental criteria should be established for determining the harmful effects of all dusts, and some classification based on the degree of harm should be devised.

A Burial Plot in a Material Yard



The Illinois Supreme Court has ruled that the grave of Andreas von Zirngibl, buried 84 years ago, must not be disturbed.

ON the river front in the heart of the great Calumet steel district on Chicago's far southeast side is located one of the several yards of the Material Service Corp., important Chicago producer and distributor of aggregates. Here, flanked on all sides by huge piles of sand, gravel and crushed stone, is a lonely grave. "Soulless" corporations have envied that dead man his last habitation, have sought to evict him without success. Although he was only a poor Bavarian fisherman and his burial plot has become a valuable piece of ground, the courts have ruled that he may rest in peace there, while above him shrieking tug-boats, the flares from blast furnaces and the reek of smoke from metallic dragons, day-and-night symbols of modernism, do their level best to disturb that peace.

A century ago, when Chicago was in its infancy, the district was known as the village of Ainsworth. From his native Bavaria came one-armed Andreas von Zirngibl, a veteran of the Battle of Waterloo and a fisherman by trade, who once held the exclusive fishing rights to some two miles of the River Danube. He had come overland, settled at Ainsworth and built a log

Close-up view of the wooden slab. Blast furnace and aggregate pile in background.

house for his family in the woods near Lake Michigan's shore. He died in 1855 and was buried near the ferry at the mouth of the Calumet River. The burial plot was inclosed with a picket fence and a wooden slab erected over the grave bearing the inscription:

Andreas von Zirngibl
A Veteran of 1816
Battle of Waterloo
Born Mar. 30, 1797
Died Aug. 21, 1855

Time passed, and the village of Ainsworth disappeared and was forgotten. A great industrial district sprang up on its site. The ferry was replaced with an immense bridge of steel and concrete; U. S. Highways 12, 20 and 41, carrying the bulk of the motor traffic from the East into Chicago, pass over the bridge within 100 ft. of the little burial plot. The ground became valuable and the 40-odd acres surrounding the grave became the subject of long litigation between the descendants of Andreas von Zirngibl and others. In 1895 the Illinois Supreme Court rendered an opinion finding that the Zirngibl heirs had established title to the grave of their ancestor and to the ground within the enclosure around it, with the right of access to it from the street *(Zirngibl v. Calumet, 157 Ill. 430)*.

The picket fence is kept painted white and a new marker has been erected over the grave; otherwise the place is little changed. Material Service Corp. vessels unloading at the dock must be careful lest their cargoes engulf the little plot and the truck drivers steer clear of it.

Meanwhile, Andreas von Zirngibl, in eternal sleep, sleeps on.

Performance Measurement and Mechanical Control—II

By ROBERT W. ROTHROCK
Chemical Engineer

THE component materials that make up the raw mix for Portland-cement manufacture are of a clay and lime nature, such as limestone, blast-furnace slag, oyster shells, clay and shale.

To become Portland cement the materials are mixed and calcined or burned. The calcined product, when mixed with water, possesses, along with other physical characteristics, the property of hardening or setting (hydrating) to form an artificial stone. This property can only be secured by causing definite minerals to form during the calcination. To do this requires that the mixture of raw materials be accurately proportioned and heated to certain definite temperatures with accurate regulation and control of the period of heating as well as the cooling procedure.

Control of Phase Equilibrium Relationships Govern Composition.—A brief presentation of an equilibrium diagram involving the principal components of Portland cement and some other mineral materials is made in this chapter to indicate some of the possible variable mineralogical relationships that may affect quality in the finished product, and also to show that success in the production process of to-day is dependent upon the findings of scientific research that could not have been definitely accomplished without the aid of precision in measurement by means of instruments.

Guess work in proportioning and in the prediction of the outcome of calcination has been largely eliminated as a result of the exploratory investigations of Rankin and Wright. They have presented [1] the essential data in graphic form as the phase equilibrium diagram shown in Fig. 1. Equilibrium as applied to the diagram means a balance between opposing forces; the forces in this case are melting and crystallization.

The diagram represents what is termed a three-component, or ternary, system and shows the relation between the composition and temperature of all the possible mixtures of lime (CaO), alumina (Al_2O_3), and silica (SiO_2). These are the oxides of the principal component raw materials entering into the cement mix.

To simplify their designations Rankin and Wright introduced the use of the letter C as the symbol for lime (CaO), A for alumina (Al_2O_3), and S for silica (SiO_2). For instance, one mineral predominant in Portland cement is tricalcium silicate, the chemical formula of which is $3CaO.SiO_2$; the abbreviated formula is C_3S. Dicalcium silicate which has the chemical formula $2CaO.SiO_2$ is represented as C_2S.

Significance of the Diagram Contour.—An understanding of this diagram enables chemists and engineers to determine the temperatures at which new minerals will form from any mixture of the three oxides and to predict the mineral composition of the final product, whether that temperature has or has not been reached in processing. Though a considerable amount of study and practice in actual use of such diagrams is necessary to make them really meaningful, some fundamental account of the various lines and their intersections should indicate the guidance value of the diagram as a first step in control and performance measurement.

The diagram is really a projection or a view looking down upon the "hills and valleys" of the complex upper surface of the equilateral prism shown in Fig. 2. Temperature is represented by the vertical distance from the base. The temperatures marked on the diagram are those at which the melt is just ready to deposit crystals, or in a general way, we may say, the temperatures at which distinct mineral compounds form.

The areas bounded by combinations of curved and straight lines within the triangle are termed "fields". The mineral labelled as lying within a field is the "high spot" on the top of the "hill" in the field with respect to temperature and the first mineral to crystallize when a melt of composition within the field is cooled. The inner boundary lines

[1] American Journal of Science, Volume 39, page 1915.

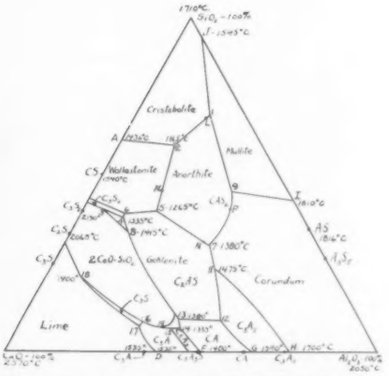


Fig. 1. The ternary system (Rankin & Wright). Phase-equilibrium diagram involving principal components of many nonmetallics.

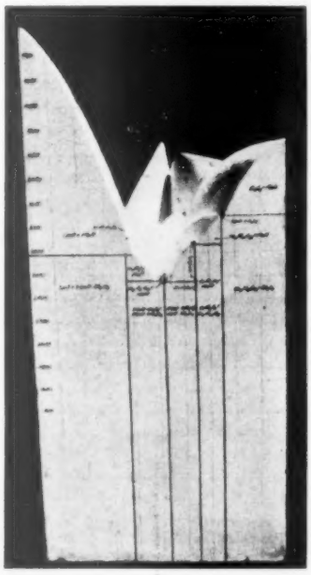


Fig. 2. Solid temperature composition model of the ternary system —lime, alumina and silica.

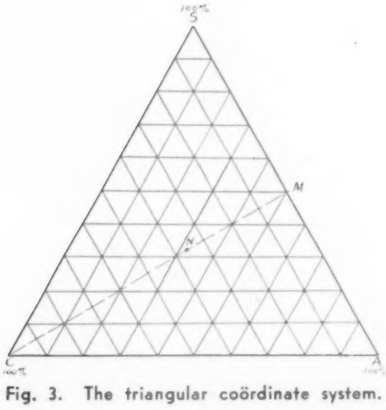


Fig. 3. The triangular coördinate system.

mark the location of the "valleys" or the lowest temperatures. The minerals of adjacent fields are compatible and, because of this, two minerals crystallize simultaneously along a boundary line. Minerals in fields that do not adjoin are not compatible. The three minerals of joining fields crystallize simultaneously at the junction of the boundary lines of three fields. This junction is termed a "quintuple" point. A large field indicates a relatively insoluble or infusable compound.

The triangular Coördinate System.—In Fig. 3, which is partially self-explanatory, each side of the triangle is divided into equal parts and, regardless of the divisions, each side usually represents 100 1-per cent. divisions. The vertices or corners represent 100 per cent. of the components S, C and A in their pure state. Zero per cent. of a given component is represented by the side opposite the vertex labelled for that component.

Any point, such as M, on a side like A-S represents a mixture of its end components only; in this example A and S only, there being none of C present. Any point within the triangle represents a mixture of all three components. If any of C is added to the mixture M, the composition moves toward C to a position within the triangle, such as at N. Similarly when adding any component to any mixture of components, the composition will change on a straight line toward the component which is added.

Possible Variable Mineralogical Relationships.—The data obtained by Rankin and Wright were secured principally by melting mixtures of lime, alumina and silica at definitely measured temperatures, then chilling them rapidly and identifying the new minerals formed. It was discovered that 18 minerals may form from mixtures of these three components and 18 combinations of these may also form, though only three of them can form simultaneously. This enables the large triangle to be divided into a number of three-component systems, termed composition triangles, as illustrated in Fig. 4. The vertices of these are the final products of crystallization. Each compound formed by the three mineral components of a small triangle is located as a point which represents its composition in terms of the components of the large triangle. There is one composition triangle for each quintuple point. When this diagram is superimposed upon the equilibrium diagram of Fig. 1, interpretations and calculations can be made. Any composition lying within a small triangle will, when crystallization is complete, be composed of all the components of that small composition triangle.

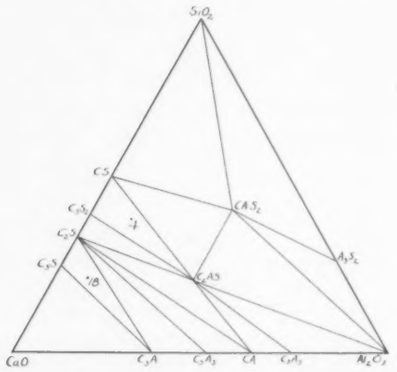


Fig. 4. Composition triangles representing final products of crystallization for mixtures of lime, alumina and silica.

Tabulated in the table, Fig. 5, are the mechanically separable crystal phases and compounds that it is possible to form from mixtures of lime, alumina and silica, as well as their percentage composition and the temperatures at which they form.

With so many stable compounds possible from mixtures of the raw material that make up Portland cement, the control and measurement of raw materials certainly are important.

It is known that the region about point 18 on the diagram (Figs. 1 and 4) represents the composition of mixtures that produce satisfactory, stable Portland cement. The region just below point 4 on the diagram involves the composition of some blast-furnace slags. To utilize blast-furnace slag in the production of Portland cement it is necessary simply to add lime and alumina until the percentage composition relative to lime, alumina and silica lies near point 18. Through suitable calculation the amount of lime necessary can readily be determined. This, too, is a step in control.

Similarly, the diagram can be shown to be of value to the ceramic, lime, glass, abrasives, refractories, smelting and other kindred process industries.

A Real Value of Measurement.—To secure the data necessary for the preparation of these graphic forms the work by Rankin and Wright is said to have required over 7,000 instrument-controlled scientifically-performed experiments, which consumed more than ten years to make, at a cost of nearly a half-million dollars.

However, knowledge of the facts gained has contributed in an inestimably high degree toward improving the quality of products of the mineral industries, toward producing new kinds of products and doing it economically, and it has made possible savings running into millions of dollars, for without suitable control and measurement by instruments data sufficiently accurate to be of such value could not have been secured.

Out of their research came a fundamental principle, in fact, the secret of control in important basic industries. It seems just common sense that for greater protection of its investment industry should strive at all times to approach similar precision in plant scale measurement in order to control variables that govern the quality of product and the performance of equipment.

Compounds	CaO	Al_2O_3	SiO_2	Temp
CaO	100			2570
SiO_2			100	1710
Al_2O_3		100		2050
$CaO \cdot SiO_2$	48.2		51.8	1540
$2CaO \cdot SiO_2$	65		35	2130
$3CaO \cdot 2SiO_2$	58.2		41.8	1475
$3CaO \cdot SiO_2$	73.6		26.4	1900
$3CaO \cdot Al_2O_3$	62.2	37.8		1535
$5CaO \cdot 3Al_2O_3$	47.8	52.2		1455
$CaO \cdot Al_2O_3$	35.4	64.6		1600
$3CaO \cdot 5Al_2O$	24.8	75.2		1720
$Al_2O_3 \cdot SiO_2$		62.8	37.2	1816
$CaO \cdot Al_2O_3 2SiO_2$	20.1	36.6	43.3	1550
$2CaO \cdot Al_2O_3 SiO_2$	40.8	37.2	22.0	1590
$3Al_2O_3 \cdot 2SiO_2$		71.8	28.2	

	Phases	CaO	Al_2O_3	SiO_2	Temp
+1	CAS_2-A_3S_2-S	98	19.8	704	1345
+2	CAS_2-S-CS	23.3	14.7	62.2	1170
4	C_2S-C_3S_2-C_2AS	48.2	11.9	39.2	1335
+5	CAS_2-C_2AS-CS	38.	20.	42.	1265
+6	C_2AS-C_3S_2-CS	47.2	11.8	41.	1310
+7	CAS_2-C_2AS-A	29.2	39.	31.8	1380
9	CAS_2-A-A_3S_2	15.6	36.5	47.9	1512
11	C_3A_3-C_2AS-A	31.2	44.5	24.3	1475
+12	C_2AS-CA-C_3A_3	37.5	53.2	9.3	1505
13	C_2AS-C_2S-CA	48.3	42.	9.7	1512
+14	C_2S-CA-C_5A_3	49.5	43.7	6.8	1335
+15	C_2S-C_3A-C_5A_3	52	41.2	6.8	1335
16	C_3S-C_2S-C_3A	58.3	33.	8.7	1455
17	C-C_3S-C_3A	59.7	32.8	7.5	1470
18	C-C_2S-C_3S	68.4	9.2	22.4	1900

	Crystalline Phases	CaO	Al_2O_3	SiO_2	Temp
A	S-CS	37.0		63.0	1436
B	CS-C_3S_2	54.5		45.5	1455
B'	C_3S_2-C_2S	55.5		44.5	1475
C	C_3S-C	67.5		32.5	2065
D	C-C_3A	59.0	41.0		1535
E	C_3A-C_5A_3	50.0	50.0		1395
F	C_5A_3-CA	47.0	53.0		1400
G	CA-C_5A_3	33.5	66.5		1590
H	C_5A_3-A	24.0	76.0		1700
I	A-A_3S_2		55.0	45.0	1810
J	A_3S_2-S		5.5	94.5	1545
L	CAS_2-S	10.5	19.5	70.	1359
M	CAS_2-CS	34.1	18.6	47.7	1299
N	CAS_2-C_2AS	30.2	36.8	33.0	1385
O	C_2AS-CS	45.7	13.2	41.1	1316
P	CAS_2-A	19.3	39.3	41.4	1547
Q	C_2AS-C_5A_3	35.0	30.8	14.2	1552
R	C_2AS-CA	37.8	32.9	9.3	1512
S	C_2AS-C_2S	49.6	23.7	26.7	1545
T	C_2S-C_5A_3	51.3	41.8	6.9	1350

Fig. 5. Compounds and phases possible to form from mixtures of lime, alumina and silica.

General plant view with incline from quarry at the left.

A quarry view showing the turn-table. The method of stripping is also illustrated.

Adds New Lime Department and Triples Crushed-Stone Output

THAT a nonmetallic-minerals operation can not remain both static and solvent is evident from the history of the Fletcher Lime Stone Co., Fletcher, N. C., a producer of crushed stone, pulverized limestone and quick and hydrated lime. C. M. Cogdill and W. N. Lance, now president and secretary-treasurer, respectively, started out in 1932 with a crushed-stone plant having a capacity of 10 tons per hr. In 1933 they built a lime kiln 8 ft. in diameter and 30 ft. in height from the firing floor. It has a capacity of 10 tons in 24 hr. In 1935 a new quarry was opened. In 1936 a hydrator and bag packer were added. In 1937 hand loading was abandoned and a new shovel was installed. A second kiln was built and a vibrating screen and crusher installed. In 1938 a pulverizer was added for the production of pulverized limestone. This operation now produces 20 tons of quicklime and hydrated lime in 24 hr. and 75 tons of agricultural limestone and 300 tons of crushed stone in 10 hr.

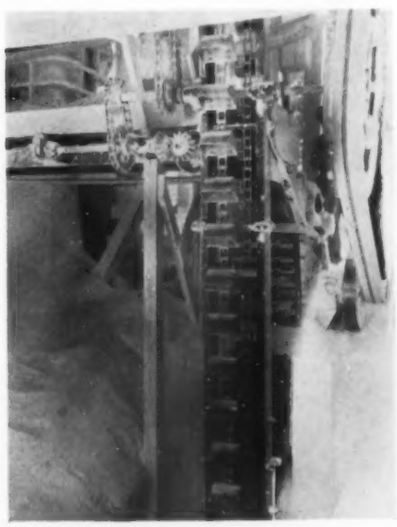
The deposit has from 3 to 4 ft. of overburden, which is removed by horse-drawn slip scrapers. Drilling of the face, which varies from 14 to 20 ft. in height, is done with Gardner-Denver jackhammers, the air for which is supplied by a portable Gardner-Denver compressor. Single-row shots are made using Hercules 40 per cent. explosive.

A Bucyrus-Erie 10-B gasoline shovel with a ⅜-cu. yd. dipper loads the stone into an Austin-Western side-dump car. A steam hoist hauls this car out of the quarry and up an incline to the plant.

Shovel loading into car. Holes being loaded for blast in background.

The car is hauled to the top of the kilns, which are mixed-feed kilns using Kentucky egg coal. Every six hours the kilns are drawn from below through shear gates into wheelbarrows. The lime is dumped on the floor and picked before it is shoveled into a jaw crusher. An elevator discharges the crushed quicklime into a 30-ton bin.

When hydrated lime is to be made the lump lime is fed to a Jeffrey hammer-mill. An elevator feeds a bin from which the lime is weighed into a 1-ton Clyde batch hydrator. The hydrated lime is discharged into a bin over a 2-bag packer. Quicklime is loaded into jute bags through spouts from the hydrator-feed bin. These spouts can also be used for loading bulk quicklime into trucks. *(Continued on page 43)*



Belt-conveyor at upper left feeds hammer-mill. Elevator feeding product to screen in foreground.

PYROPHYLLITE MINING UNDERGOES REVIVAL

By W. E. TRAUFFER

THE production and marketing of pyrophyllite as such is a comparatively new industry, although this material has been sold as talc for many years. Chemically pyrophyllite is a hydrous aluminum silicate, while talc is a magnesium silicate. They have distinctly different chemical and ceramic properties. This distinction has become important through the recent use of pyrophyllite in the manufacture of ceramic products, porcelain, enamel and glass. It has a hardness of from 1 to 2 and its specific gravity is about 2.8.

One of the most important deposits of pyrophyllite is the Gerhardt deposit on Soapstone Mountain, which is owned by the Carolina Pyrophyllite Co. This company, which is controlled and operated by the United Feldspar Corp., in November, 1937 put in operation a new plant at Capyco, near Staley, N. C., to process this material. This plant has a capacity of from 50 to 60 tons per 24 hr. on an average range of sizes. Previously the raw pyrophyllite had been shipped from this deposit to the plant of the affiliated Tennessee Mineral Products Corp. at Spruce Pine, N. C., for processing.

This deposit is about 4 mi. west of the plant and was discovered 12 years ago by Paul Gerhardt and the late Charles Gerhardt who developed the mine and shipped the crude material. The present owners took over the deposit in 1935. It was first developed as a mine with a tunnel and drifts, but is now operated as a glory-hole mine with a shaft through which material drops into the tunnel that is now used for haulage. Drilling is done with jackhammers and 40-per cent. gelatin dynamite is used. In the haulage tunnel large pieces are broken down with sledges or by secondary drilling and shooting. The pyrophyllite is graded as it is put by hand into trucks, which are backed into the tunnel for loading.

A solid wall of pyrophyllite at the Capyco deposit.

View in the mine looking up through glory hole.

A view of the plant with raw-material storage at left.

About 80 per cent. of the mined material is suitable for Standard Capyco pyrophyllite. About 15 per cent. is slightly stained and is sold as No. 3 grade, suitable for use where color is not important. The analyses of these grades follow:

	Standard	*No. 3*
SiO_2	75.3	75.4
Al_2O_3	20.5	20.3
Fe_2O_3	0.1	0.3
CaO	0.2	0.2
K_2O+Na_2O.	0.3	0.2
Loss	3.6	3.6
	100.0	100.0

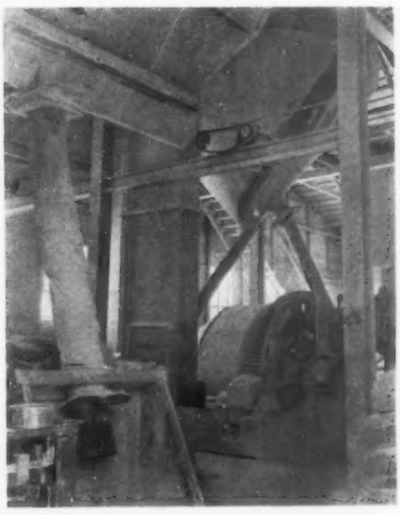
At the plant there is ground storage for 1,000 tons of crude pyrophyllite. A paved ramp leads up to the crude-material storage building, which has seven stalls, or ground-level bins, of 100 tons capacity each. Regular grades of pyrophyllite are stored in six of these stalls and the secondary grade is stored separately.

Uniformity of product is made possible by blending pyrophyllite from three or more bins at the primary crusher. Wheelbarrows are used to feed this machine, which is a 10-in. by 18-in. Reliance Universal Road Machinery Co. jaw crusher. An 18-in. belt-conveyor carries the crushed material to a bucket-elevator from which it is discharged into two steel surge bins of 30 tons capacity each. Sliding gates control the discharge from these bins

Truck emerging from entrance tunnel. Glory-hole opening near top of the hill at upper left.

on two 12-in. belt-conveyors, which feed the two grinding mills. Each gate is operated through a double-pawl mechanism by a ½-hp. gearmotor. With this method it is possible to control the feed passing through each gate in tenths of a ton through a range from ½ ton to 8 tons per hr.

The No. 1 mill is an 8-ft. by 36-in. Hardinge conical mill, which is driven at 27 r.p.m. by a 75-hp. motor through Dayton Cog Belts. Belgian flint pebbles and Silex liners are used as the grinding media. An elevator discharges the mill product through a screw-conveyor into a 14-ft., Model 21 Gayco air-



The No. 1 grinding mill. At left is spout for bag loading from finished-material bins.

separator, which can be set to produce any size of material from 60- to 325-mesh. The oversize or rejects coming from this separator are returned by gravity to the feed end of the mill or can be sacked through a spout. The finished product is discharged from the separator into a bucket-elevator, and a screw-conveyor discharges it into either of two steel bins of 50 tons capacity each.

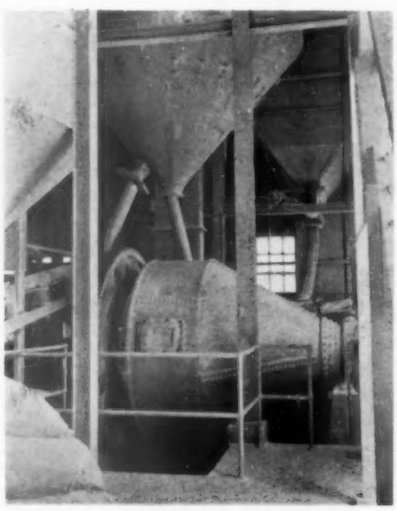
The No. 2 mill is an 8-ft. by 30-in. Hardinge conical mill, which is also driven at 27 r.p.m. by a 75-hp. motor. This mill is overpowered because special heavy pebbles are sometimes substituted for the flint pebbles ordinarily used. This mill operates in closed circuit with another 14-ft., Model 21 Gayco separator, and the finished product is similarly delivered to one of the

The No. 2 conical mill with feeder and return spout from separator.

two steel bins previously described. Burlap bag tops keep the dust from escaping from these bins at the same time releasing air pressure set up in the grinding circuit by the air-separator.

The two finished-product bins are hopper-bottomed, and screw-conveyors extending from them out to the edge of the loading platform are used for bulk-loading of cars. A 3-valve bag-packing machine is connected by chutes to both the screw-conveyors.

The plant was designed for maximum flexibility and the two grinding circuits can be run together or separately as desired. Additional grinding systems can be added on either side of the two present units by extending the sectional steel building. The crude-material bins can also be extended in either direction.



Another view of the No. 1 grinding mill with feed conveyor at left.

All the bucket-elevators are steel-inclosed and have felt gaskets and mastic dust seals. Each circuit is operated by a 25-hp. motor driving a shaft, from which the separator, screw-conveyors and bucket-elevator are driven. Each of the raw-material elevators is driven by a 3-hp. gearmotor, and the two bulk-loading screws have 2-hp. gearmotors.

The main office of the Carolina Pyrophyllite Co. is at 10 E. 40th St., New York, N. Y. Ch. H. Peddrick, Jr., is president and Robert F. Sherwood is sales executive. B. C. Burgess is manager of both the Carolina Pyrophyllite Co. and the Tennessee Mineral Products Co. Sales are made through E. I. du Pont de Nemours & Co., R. & H. Chemicals Dept. H. W. Brinkley is superintendent of this plant and F. P. Buckels is office manager.

Fletcher *(from page 41)*

When crushed stone is being produced the quarry car is dumped at a point part of the way up the incline into a 15-in. by 24-in. Diamond jaw crusher. A 22-in. by 27-ft. belt-conveyor carries the crusher product to a 50-ft. belt bucket-elevator which in turn discharges it on a 3-ft. by 8-ft., 3-deck vibrating screen. Oversize material drops through a chute to a 22-in. Diamond double-roll crusher and through the same circuit to the screen. The three finished sizes of stone are discharged into bins.

Pulverized limestone is made from stone drawn from these bins on an 18-in. by 30-ft. belt-conveyor which feeds a Universal Crusher Co. hammer-mill. The product is elevated to a small Simplicity screen, which returns the oversize to the mill. The finished product drops into a bin, from which it can be loaded through spouts into sacks or trucks.

Six Chevrolet dump trucks are used to deliver the crushed stone and pulverized limestone. These trucks also haul 1¼ mi. to the Southern Rwy. for railroad shipments. Some lime is also shipped by railway in the same manner.

A 60-hp. Caterpillar Diesel engine drives all the lime-plant equipment through flat belts. All the other equipment is driven from a 60-hp. and a 100-hp. electric motor. A Cletrac tractor is used for general utility about the plant and quarry.

Symposium on Lime Is Program Feature at A.S.T.M. Gathering

AN extensive symposium on lime was a feature of the 1939 regional meeting of the American Society for Testing Materials, held in Columbus, O., on March 8, during A.S.T.M. committee week. The Society's Committee C-7 on Lime, headed by Prof. J. R. Withrow, Ohio State University, sponsored the symposium, which covered a number of fundamental aspects, certain research angles, and dealt especially with problems in the practical application of lime in its various forms.

In the summary and conclusions of his paper, *Variations in the Properties of Dolomitic Lime Putties with Method of Hydration,* John E. Conley of the Bureau of Mines pointed out that: (1) the properties are affected by calcination history and by hydration conditions; (2) hydration with an excess of water produces a more plastic hydrate and a putty of greater volume than when the lime is hydrated with the theoretical water to yield a dry hydrate; (3) control of calcination conditions to produce an active form of magnesia and subsequent temperature control to insure complete hydration of the magnesia are desirable to produce a superior hydrate of high plasticity and high putty volumes for use as finishing plaster; (4) generally, those hydrates that yield high putty volumes are slow settling.

In covering the *Quality of Lime Desired for Water Treatment,* Chas. P. Hoover of the Columbus, O., waterworks summarized his opinions as follows: When considering lime specifications, the principal factors which determine the usability of lime for water treatment are the percentage of available calcium oxide and the slaking properties; determinations of other ingredients are unnecessary. The percentage of water-soluble oxide to be specified and the type of lime to be used can best be determined by giving consideration to quantity of lime required, location of lime-producing plants, storage facilities at the water-treatment plant, and type of equipment available for applying the lime to the water under treatment.

In their paper, *Criteria for the Evaluation of Agricultural Ground Limestone,* the authors, R. M. Salter, Ohio State University, and C. J. Schollenberger, Ohio Agricultural Experimental Station, showed that the size composition of commercial ground limestone can be plotted as a straight line, and the relative efficiency of the several size grades on the market predicted therefrom with practical accuracy. The correspondence of value calculated from sieve analysis with that observed in a long-time field experiment was pointed out.

From theoretical considerations, supplemented by experiments with uniform weights of a number of 48- and 65-mesh limestones and soil kept under conditions intended to simulate those in the field, a relation between chemical composition and dissolution in soil has been worked out. This is expressed by the equation:

$$R = \frac{\text{Percentage of calcite, impurity-free}}{1.64} + \frac{\text{Percentage of dolomite, impurity-free}}{1.205}$$

in which R is the percentage of added carbonate residual at the end, and the denominators are dissolution constants applying respectively to calcite and dolomite. These constants will vary with particle size, time, and other experimental conditions, but for practical comparisons of the probable value of limestones differing only in chemical composition and with other conditions similar, the average values given should serve. The percentages of carbonate minerals calculated from analysis are reduced to the impurity-free basis by the factor:

$$\frac{100}{100 - \text{percentage of impurities}}$$

The percentage decomposition is then $100 - R$, but requires a correction for the deficiency in application due to the content of impurities, or

$$\frac{(100 - R)\ 100}{100 - \text{percentage of impurities}} =$$

corrected percentage decomposition. Considering the uncertainty as to the status of impurities in a commercial ground limestone, that is, as to whether such impurities were an intimate constituent of the original rock, or were segregations of gangue, etc., ground with it or perhaps even of extraneous origin, the agreement between observation and calculation appears to be quite good.

In his paper, *Fundamental Mechanics of Calcination and Hydration of Lime and Methods of Control,* V. J. Azbe emphasized certain factors: First, lime (and particularly some lime) should be burned at lower temperatures; second, most lime on the market is over-burned; third, much can be done by merely reducing the size of stone and increasing the frequency of draw and through arrangement for better trimming facilities; and fourth, to accomplish the most, however, temperatures must be controlled by means of recirculation of hot gases. While by lowering the temperatures, heat transfer is lowered, that is made up by increasing the heat absorbing surface, increasing the rate of flow of the gases, raising the burning zone, obtaining more uniform cross-sectional flow and elimination to a great extent of blocking by fines and by retaining the lime in a state permitting ready liberation of CO_2 without excessive internal CO_2 and the consequent greater external temperatures necessary.

The paper dealing with *Lime Characteristics and Their Effect on Construction* included considerable information and data developed by the author, Prof. Walter C. Voss, of the Massachusetts Institute of Technology. Among the various points listed in his summary were the following: (1) 45 lb. is a rational average value for 1 cu. ft. of lime solids; (2) apparent yields of putties are misleading and tend toward oversanding—lime putties should be used on a "lime-solids" basis; (3) waterproofed limes produce putty light in weight and therefore give a fictitious yield and a more porous structure.

In other papers of the symposium, F. C. Welch of the Western Lime & Cement Co., Milwaukee, Wis., discussed the hydration of magnesian lime and the autoclave test; A. H. Nieman of the Ohio Hydrate & Supply Co., Woodville, O., told of manufacturing problems involved in producing lime for the glass industry; D. E. Washburn of the American Lime & Stone Co., Bellefonte, Pa., told of some of the factors affecting milks-of-lime employed in industry; a preliminary investigation of the determination of fluorine in lime was reported by C. J. Koehler of the National Gypsum Co., Buffalo, N. Y.

DUST EXPOSURE IN NEW YORK QUARRIES

THE dust hazard in rock drilling in New York state is regulated by Industrial Code No. 33 and certain rules promulgated by the Industrial Commissioner. According to the terms of this code, all rock formations are divided into two classes depending on their free silica content, as follows:

Class I—Rock formations containing uniformly less than 10 per cent. by weight of free silica, and

Class II—Rock formations containing 10 per cent. or more by weight of free silica and those formations having a variable and unpredictable content of free silica.

Under this classification the code allows dust concentrations up to and including 100,000,000 particles per cu. ft. of air for drilling operations in Class I rock whereas the maximum permissible dust concentration for drilling in Class II rock is fixed at 10,000,000 particles per cu. ft. of air.

Rock Sampling.—Since the code allows a 100,000,000 count for Class I rock but only 10,000,000 for Class II, it is obvious that in the enforcement of the code the problem of determining a just classification of the rock is extremely important.

Most of the sampling of the state's quarries is performed by the Division of Inspection. In the course of a regular inspection visit to the quarry, the inspector takes a sample of the rock and forwards it to the Division of Industrial Hygiene. The sample is then analyzed in the laboratory of the latter division to determine its free-silica content and subsequent classification under the code.

Some of the quarries that have been sampled are many acres in area and have working faces as high as 200 ft. Often there are several formations of different kinds of rock occurring at various depths or at different sections of the quarry. Obviously a representative sample can not be obtained under such conditions merely by sampling the rock at one point. Therefore, in order to obtain samples that are representative of the quarry as a whole, the samples were taken from the large storage piles of quarried stone that had been through the crushing process. These piles often represent the accumulation of several months of operation and contain well-mixed stone from all parts of the quarry. Sampling these piles is usually done with the aid of a clam-shell bucket or bucket-loader. With the clam-shell bucket grab-samples are taken here and there about the pile as well as from its interior; these grab-samples are deposited together in a separate pile and after a representative sample has been taken the sample pile is thoroughly mixed by raising and dropping the stone by means of the clam-shell bucket. Since the sample pile thus taken usually amounts to from one to two tons it is necessary to quarter it down until a final sample of about 35 lb. is obtained.

In a few of the largest crushed-stone quarries the sampling procedure is considerably simplified because the crushed stone is stored in large concrete silos that are filled and unloaded via a conveyor system. Here conveyor belts lead from under the bins to the wharfage or railroad siding where scows or freight cars receive the stone for shipping. To obtain a good sample of the quarry's production here, it is only necessary to open the discharge gate in the storage bin selected and run about a ton of stone onto the conveyor. Handfuls of rock can then be selected at random from the belt until a 35-lb. composite sample is obtained.

Factors Influencing Dust Exposure.—The quarrying of stone is carried on in the open air and under conditions of varying wind velocity. Moreover, several different types of drills and drilling techniques are employed. Taking it for granted that the classification of the quarry stone is established, the question arises as to the average degree of dust exposure in such quarries. This report presents the findings of a study designed to answer this question both in Class I and Class II quarry drilling operations.

The dust exposure of the quarry driller depends on a number of variables, as follows:

1. Type of drill used.
2. Drilling rate.
3. Location of drilling.
4. The actual amount of time that the driller spends drilling during his shift.
5. The wind velocity.

In general, four types of drills are used in the quarries of New York state: jackhammers, drifter drills, wagon drills, and well drills.

Jackhammers are unmounted, self-rotated, hand-held drills, and are usually handled by one man. The jackhammers found in the quarries studied were of the puff type. In puff type hammers the air necessary to keep the cutting bit free of rock chips is forced through the drill steel in intermittent "puffs" by the action of the piston.

Drifters are mounted drills and the driver crew is ordinarily comprised of a drill runner and a helper. The drifter drills tested in this study were mounted on tripods.

Wagon drills are used in a small number of upstate quarries. They consist of the drifter-type drills mounted on a carriage and are used for drilling approximately vertical holes.

Well drills operate under wet conditions with no dust hazard whatever; therefore no dust counts are included on well drills.

The drilling rate depends on a number of factors, foremost among which are the following:

a—Type and diameter of bit.
b—Air pressure at the drill.
c—Hardness of the rock.
d—Temper of drill steel.

The location of drilling affects the dust exposure of the driller because it determines how much the driller may have to bend over his drill, whether or not holes are deep and have to be blown free of cuttings and whether or not the driller must work in a confined area such as very close to the face of the quarry.

The amount of time that the driller actually spends drilling during the day also affects his daily dust exposure. Secondary drillers (jackhammer men) spend a considerable amount of their time in moving the compressed air lines about the quarry and time is also spent in getting fresh steels from the drill shed or racks.

Finally, in such open, outdoor operations the prevailing wind velocity is of great importance in controlling the amount of dust reaching the breathing zone of the driller.

In the face of so many variables no attempt was made to correlate every factor with the amount of dust generated. The immediate objective was to ascertain whether or not the actual drilling operations produced an average dust exposure in the breathing zone of the driller in excess of the maximum allowable under Code No. 33.

The tests reported were carried out while the drillers were engaged in their regular drilling outline so that the conditions obtaining are truly representative.

Class I Quarries Studied.—Four of the largest quarries in their respective fields were used in the study on the dust produced in drilling Class I rock. The various kinds of stone quarried included dolomite, trap rock, limestone and cement rock.

Class I Quarry Dust Counts.—The dust determinations were made in four Class I quarries producing stone that

showed a range in percentage of free silica of from 4 to 9 per cent.

A total of 36 dust counts was made by means of the standard light-field technique, all samples being taken in the breathing zone of the driller except where the driller's helper was separately tested. The findings of these counts are summarized in Table I.

Investigation showed that jackhammer drillers actually drill from 2 to 4 hr. per day. During these studies the wind velocity ranged from 3 to 19.0 mi. per hour, and averaged 8.6. The drilling rate ranged from 3.0 to 13.3 and averaged 5.3 in. per min. The dust exposure of the driller ranged from 1.3 to 178 million particles per cu. ft. of air and averaged 50.2 million particles per cu. ft. In all, 24 samples were taken and of these only two disclosed counts of over 100 million.

Thus, the average dust exposure of jackhammer drillers is less than 100 million particles per cu. ft. of air and hence meets code requirements for Class I stone.

Wagon-drill operators were found to have an average daily exposure of 6 hr. per day in actual drilling. Here the drilling rate ranged from 4.0 to 6.7 in. per min. and averaged 5.5. The wind velocity affecting the dilution and dispersion of dust varied from 8.0 to 13.0 mi. per hr. and averaged 11.0. The dust exposure of the driller ranged from 4.1 to 132 million particles per cu. ft. and averaged 38.0 million. Of the seven counts made only one was above 100 million particles per cu. ft. of air.

The conclusion from this study is that, on the average, wagon drilling in Class I quarries is associated with dust concentrations in the breathing zone of the driller averaging less than 100 million particles per cu. ft. of air.

Drifter drilling is employed only to a very limited extent in New York state quarries. Nevertheless, tests were made on this type of drilling in an effort to establish the dust exposure in such operations.

Exposure of the driller varied from 24 to 79 million particles per cu. ft. and averaged 57.0, whereas the dust exposure of the driller's helper ranged from 60 to 65 million particles per cu. ft. and averaged 62.5 million. The helper's exposure was principally due to his assignment to blow out the hole after each steel change.

The results showed no dust counts over 100 million particles per cu. ft. Therefore, the conclusion is that drifter drilling as practiced in New York state Class I quarries is associated with dust exposures of less than 100 million particles per cu. ft. of air and hence meets code requirements for Class I rock drilling.

TABLE I—Dust Counts in Class I Quarries

Type of Drilling and Stone	Drilling Rate (*in. per min.*)			Wind Velocity (*m.p.h.*)			Dust Count (*millions per cu. ft.*)		
	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
JACKHAMMER									
Block-holing dolomite	13.3	5.7	10.4	8.0	3.0	5.0	91.0	50.0	64.0
Block-holing trap rock	4.0	3.0	3.4	15.0	5.0	8.0	178.0	6.0	70.4
Block-holing limestone	6.2	3.9	5.2	19.0	6.0	11.0	53.0	1.3	21.8
Ledge-drilling limestone	7.7	4.3	5.3	15.0	6.0	8.0	95.0	15.0	54.8
	13.3	3.0	*5.3	19.0	3.0	*8.6	178.0	1.3	50.2
DRIFTER									
Bottom-drilling dolomite (driller's exposure)	12.2	10.1	11.1	6.0	2.0	5.0	79.0	24.0	57.0
Bottom-drilling dolomite (helper's exposure)	9.7	9.7	9.7	6.0	2.0	4.0	65.0	60.0	62.5
	12.2	9.7	*10.5	6.0	2.0	*4.6	79.0	24.0	*59.2
WAGON DRILLING									
Vertical down—limestone	6.7	4.0	5.5	13.0	8.0	11.0	132.0	4.1	38.0

* Overall average, based on number of tests in each case.

Rock Drilling in Class II Quarries.—In the Class II quarries of the state wagon drills, jackhammers and well drills were encountered.

Well drills, because of the water used and their extremely slow rate of penetration, did not produce significant amounts of dust. For this reason they were disregarded in the study.

Dust determinations in connection with wagon and jackhammer drilling are summarized in Table II. In this table are presented the dust counts and free-silica determinations in four wagon-drilling operations and in seven jackhammer-drilling tests.

The four distinct wagon-drilling operations are designated arbitrarily as A, B, C and D. All the corresponding rock formations are Class II and range from 24 to 58 per cent. of free silica. The average dust counts ranged from 14.3 to 36 million particles per cu. ft. of air.

Wagon drilling, therefore, in the open in Class II rock is associated with average dust counts of more than 10 million particles per cu. ft. of air and hence such operations require the use of approved dust-control methods in order to meet the requirements of Industrial Code No. 33.

The seven jackhammer-drilling operations are designated arbitrarily by the letters E to K inclusive. All this drilling was done in the open in Class II rock, whose free-silica content ranged from 20 to 42 per cent.

TABLE II—Dust Counts in Class II Quarries

Quarry	Type of Drilling	Percentage of Free SiO_2	Average Dust Count (*millions per cu. ft.*)
A	Wagon	42	14.3
B	Wagon	27	33.0
C	Wagon	24	36.0
D	Wagon	58	20.0
E	Jackhammer	42	25.2
F	Jackhammer	39	33.0
G	Jackhammer	34	70.0
H	Jackhammer	20	18.0
I	Jackhammer	27	24.7
J	Jackhammer	24	26.0
K	Jackhammer	33	80.0

The average dust counts found ranged from 18 to 80 million particles per cu. ft. of air.

From these data, jackhammer drilling in the open in Class II rock is associated with average dust counts of more than 10 million particles per cu. ft. of air, and hence such operations require the use of approved dust-control methods in order to meet the requirements of Industrial Code No. 33.

Summary.—From these studies the following fundamental conclusions are drawn:

1—Rock drilling in the open, in Class I rock, is on the average, accompanied by a dust concentration, in the breathing zone of the worker, of less than 100 million particles per cu. ft. of air.

2—For Class I rock this amount is within the limits of, and meets the requirements of, Industrial Code Bulletin No. 33, and therefore when Class I rock is being drilled in the open, it has been recommended that it is unnecessary to require the use of approved dust-control methods in order to meet the requirements of the Code.

3—Rock drilling in the open, both in Class I and Class II rock, is on the average always accompanied by a dust concentration in the breathing zone of the worker of more than 10 million particles per cu. ft. of air.

4—For Class II rock this amount is above the limits permissible under Industrial Code Bulletin No. 33, and therefore when Class II rock is being drilled in the open, it is recommended that approved methods of dust control, as specified in Code No. 33, be provided.

By Z. H. MISCHKA

State Legislatures Enact But Few of Threatened Handicaps to Operators

THE first of the 43 state law-making bodies that convened in regular sessions shortly after the turn of the year adjourned last month, leaving behind them scores of new laws and, in several states, piles of unfinished business. Not a few of the enacted proposals concern the stone, sand and gravel industries; and pit-and-quarry measures are also among those that went down to defeat.

Statutory limits placed on legislative sessions forced adjournment of several law-making bodies before action could be completed on many measures. In several states, notably South Carolina, Oregon and Arizona, law-makers worked on for days without pay in an effort to push "must" bills through to final passage, while in most other states, where adjournment took place last month, legislative clocks were stopped so that work accomplished after constitutional deadlines could be cloaked with legality.

In approximately half of the states the legislatures will continue to work through much of April, and in many they will not complete their sessions until months later. The legislature of a forty-fourth state, Florida, will convene April 4.

In several states where legislators have closed their desks and departed for their homes there is already talk of special sessions. They would be called to pass additional revenue measures, necessitated primarily by liberalized social-security legislation. The measures to be considered would not concern the pit-and-quarry industries except as a branch of business generally.

Stone, sand and gravel producers, surveying the work accomplished by their respective state legislatures and indicated action on measures pending before law-making bodies still in session, collectively may be thankful that few of the threatened handicaps on the operation of their business were imposed.

State wage-and-hour bills, outstanding among general measures brought before the various law-making bodies, failed of passage in every case where legislative action had been completed up to the time PIT AND QUARRY went to press.

The following summary gives bills of specific interest to members of the pit-and-quarry industries enacted into law or rejected where legislatures have completed their work, and the status of pending measures in legislatures that were still in session in late March:

Alabama.—Before recessing in mid-March the legislature provided for a state department of industrial relations. It was the sole enactment in the field of labor legislation, while no new laws of more direct application to the pit-and-quarry industries were passed. The legislature will resume its session July 17.

Arizona.—Several bills which would have placed further handicaps on stone, sand and gravel producers failed of passage. Among them were measures to enact a state wage-hour law, to boost the privilege sales tax on limestone, sand, gravel and other mineral products from 1 to 2 per cent., and to include occupational diseases under the workmen's compensation act. The legislature adjourned in March.

California.—After a recess of six weeks the California legislature reconvened last month to consider more than 4,000 proposals, among them scores of labor measures of all descriptions and an assembly bill to levy a series of severance taxes.

The severance-tax measure, which has been referred to the committee on revenue and taxation for study, would tax lime, limestone, silica and alumina, used in the making of Portland cement, 15 c. per bbl. of cement made from any such materials; borates at $2.50 per ton; and all other natural resources severed from the land or water 1 per cent. of the market value at the quarry, pit, mine or other place of severance. If passed, the act would become effective Jan. 1, 1940.

Colorado.—Two Senate bills would prohibit the use of private detectives to investigate labor or serve as enforcement officers during a labor dispute, and would outlaw the practice of deputizing special deputy sheriffs during labor difficulties.

Connecticut.—The judiciary committee has for study a House bill which would provide that, in case of accidental injury or occupational disease, compensation would not be paid unless causally traceable to employment as such. In the case of a preëxisting occupational disease total compensation would be recoverable from the employer who last employed the employee and in which employment the disease was contracted. The bill also provides for the apportionment of compensation among several employers. A Senate bill seeks to place the burden of proof in occupational-disease cases under the workmen's compensation law upon the employer.

Also pending is a Senate bill to provide for the purchase of materials and goods by the state from firms in the state.

The House killed, on an adverse committee report, a bill which sought to provide that vehicles using public highways shall not carry more than one full tank of explosives, which shall not exceed 35 gal. in size, except where the vehicle has a license to carry explosives.

Delaware.—House approval has been given a bill designed to bring non-resident contractors under the occupational-disease law through licensing. A Senate bill, referred to the committee on miscellaneous, would exempt gravel from the provisions of a 1937 act regulating the taking of sand from the beaches along the Delaware River, Delaware Bay and Atlantic Ocean.

A wage-hour bill has been introduced in the House and referred to a committee, while a Senate bill seeks to combine the present labor commission, the industrial-accident board, unemployment-compensation commission and board of boiler rules into a new Department of Labor and Industry.

Idaho.—The legislature approved a measure recognizing for the first time in the state's history the right of a workman to be compensated for occupational disease acquired in the course of his employment. In the case of silicosis, which comprises 95 per cent. of the cases of occupational disease in Idaho, a workman would receive $500 on total disability during the first month of the law's operation, $550 during the second month, $600 during the third month, and so on until a maximum of $3,000 has been reached.

The legislature also set up a bureau of industrial hygiene in the department of public welfare.

Legislative approval was given a Senate joint resolution petitioning the department of public works to use Idaho timber and cement if practicable.

Illinois.—Identical bills introduced in both branches of the legislature seek to eliminate the use of machinery in the production of crushed rock or other road material by convict labor, and would restrict the use of material under the convict-labor act to public institutions owned and managed and controlled by the state or for the improvement of public grounds owned or managed and controlled by the state. The bills would also repeal an act authorizing the employment of convicts and prisoners in penal and reformatory institutions of the state in the manufacture of tile and culvert pipe for drainage purposes, and an act authorizing the employment of convicts and prisoners in the preparation of road-building materials and in working upon public roads. The Senate bill, No. SB 31, has been referred to that body's committee on judiciary, while the assembly measure, No. HB 55, has been referred to that body's committee on charities and corrections.

Another House bill would provide that whenever the state or any political subdivision, or any municipal corporation of the state, or any agency or instrumentality of any of those public bodies is authorized or required to purchase gravel for use in performing its official duties, it shall purchase gravel mined in the state, if the cost, including transportation charges, is not more than 10 per cent. greater than the cost of gravel mined outside the state. The bill has been referred to the committee on efficiency and economy.

Indiana.—The legislature refused to pass a wage-hour bill, first rejecting a measure patterned after the national Fair Labor Standards Act of 1938, and then rejecting a bill which merely established a minimum wage of 25 c. an hr. without restricting the hours of work in a day or week. Also rejected was a bill to increase sharply the minimum payments under the workmen's compensation act, which, during a committee hearing, Sam Hadden, Indianapolis, secretary of the Indiana Aggregates Assn., said would result in the use of more labor-saving machinery and would tend to drive industries from the state.

Plans to levy a gross income tax on sand and gravel being dredged from Lake Michigan in Lake and Porter counties for shipment to Chicago also failed to materialize.

Legislative approval was given, however, to a bill amending the unemployment-compensation law in several respects. It reduces the partial-benefit waiting period from 4 to 2 weeks, eliminates the second waiting period, places a flat .135 of 1 per cent. of employers' contributions in the state pooled account, in place of the present flat one-sixth of his contribution; reduces to 1 per cent. of the total pay-roll the contributions of employers whose reserve accounts reach 11 per cent. of the preceding year's pay-roll, in place of the present 12 per cent.; make the guaranteed employment plan of the old law workable; delays for one year, to Jan. 1, 1941, the penalty tax of 3.7 per cent. against employers whose reserve accounts have become exhausted; exempts employers from contributions when their reserve accounts equal 15 per cent. of their pay-rolls of the preceding year; adds to the persons ineligible to benefits people who leave their employment for martial obligations and persons discharged when they admit having been, or are proved in court to have been, dishonest; and places additional penalty on benefit "chiselers" by depriving them of three weeks of benefits.

Iowa.—A favorable committee report was given a Senate bill to authorize the condemnation of private lands to obtain gravel and other suitable material for secondary-road surfacing, while a House bill favorably reported would permit the use of gravel from gravel beds owned by counties for the surfacing of lanes and driveways leading to surfaced public roads when "such surfacing is necessary or advisable to protect said public road".

Maine.—Both state wage-hour bills and labor relations measures, patterned, respectively, after the national Fair Labor Standards Act and the Wagner act, were introduced in the Senate.

Michigan.—The House committee on general taxation has for revision a Senate-approved bill to prohibit the removal of sand, gravel or other minerals from tax-delinquent lands.

The senate committee on labor is considering a bill to make all occupational diseases compensable, to remove the maximum limit of $3,000 compensation, to provide for additional surgical and hospital service, and to provide for the examination of employees by three physicians in cases where petitions are filed to discontinue compensation.

The sudden death of Gov. Frank Fitzgerald has made uncertain the legislative approval of measures intended to reduce industrial disputes within Michigan.

Missouri.—The failure of a bill to create a board to fix the amount of a tax to be levied upon all employers of labor using any labor-saving device was indicated when the revision committee recommended striking the House bill. The measure, which could be revived by a majority vote of the lower house —action which is considered unlikely —would tax labor-saving machinery from 25 to 50 per cent. of the total cost of the labor saved.

A Senate bill to extend the sales tax to building materials has been referred to the committee on ways and means. It would add a section to the statutes reading as follows:

"Sales of building materials in their original or processed form used or to be used in construction or repair work of any character under contract or bid. In such transactions the contractor shall be deemed a dealer in and purchaser of said materials for resale, and not the user or ultimate consumer thereof."

Montana.—Following the killing a month ago of a bill to enact a state wage-hour law, the legislature last month discarded a proposed state labor-relations act. The legislature also refused passage of a bill to provide state coöperation in enforcing the national wage-hour act.

Passed and signed by the governor were bills to create an industrial-hygiene division in the state board of health and to memorialize congress to include sufferers of occupational diseases under the social security act.

Nevada.—Newly-introduced bills would bring occupational diseases under the workmen's compensation insurance statute, and would require employees to pay a state unemployment compensation tax equal to one-half of the 2.7-per cent. tax paid by employers.

New Jersey.—A House bill, referred to the insurance committee for study, would provide that a claimant for compensation for compensable occupational diseases shall file his petition within two years from the time such claimant ceased to be exposed to such occupational disease.

New Mexico.—The House of Representatives, by decisive majorities, voted down both proposed state wage-hour acts and labor-relations bills.

New York.—Pending Senate bills would authorize the conservation commission to fix rules and regulations for the sale of sand, gravel, stone and forest products in areas outside Adirondack and Catskill Parks heretofore or hereafter acquired by the conservation department for reforestation purposes, and would permit a town superintendent, with the approval of the town board, to purchase gravel or stone for town highways from without the town and would permit first-class towns to purchase land containing gravel beds at a total cost in excess of $1,000.

Two bills seek to increase sharply compensation benefits in silicosis and other dust-disease cases under the workmen's compensation act. One would provide that benefits for disability and death shall increase at the rate of $100 each month for 48 months, instead of at the rate of $50, and the maximum compensation of $3,000 would be stricken out. The second

would increase from $3,000 to $7,100 the maximum aggregate total compensation allowed to a workman in silicosis or other dust-disease cases.

North Dakota.—The legislature wound up its work early in March without adding burdens to the pit-and-quarry industries either in the form of special taxation or restrictive labor measures.

Ohio.—A House bill would authorize the sale of the state-owned Roseville brick plant. The measure was awaiting committee assignment.

The House labor committee scrapped a proposed state wage-hour law, indicating that the passage of such a measure during the current legislative session is very unlikely.

Oklahoma.—M. O. Mathews, president of the Oklahoma Portland Cement Co., Ada, appeared before the Senate committee on state affairs to challenge the contention of proponents of a state-owned cement plant that cement could be produced for about 50c. a bbl. The measure was introduced early in the session by Sen. W. L. Mauk, who seeks a $500,000 appropriation for the project. The actual cost of producing cement, exclusive of delivery costs, at the Ada plant is $1.50 a bbl., Mr. Mathews told the committee. He questioned whether the right kind of limestone in large quantities was available in Murray County, the site of the proposed plant, and told the committee that the construction of such a plant would cost between $1,500,000 and $2,000,000, or up to four times the amount that would be appropriated by the bill. During Mr. Mathews' discussion of the bill, Committee Chairman Boyd Cowden commented: "Well, I don't know just how much it costs to make cement, but I do know that if you would get the cement folks down to competitive bidding, as on printing, the price to the state would be less."

The Oklahoma Municipal League has introduced a bill to provide low-cost paving, walks and sewers which its proponents declare would markedly increase such improvements throughout the state. Excessive finance costs, it is claimed, have made present statutes virtually inoperative. The new bill would make the cost of the improvements payable by installments, carrying low rates of interest now available to municipalities. Home owners would be able to have intermediate-type walks laid for about $2 a year, making payments in quarterly installments.

Oregon.—Final legislative approval was given a bill to provide for the acquisition, by the state for public use, of real property containing limestone and other road materials.

A Senate bill which sought to authorize a mines safety director to inspect pits and quarries and enforce industrial-accident-commission orders died in committee at the close of the session.

Pennsylvania.—Explosives used in stone quarries or in clay mining would be excluded from the provisions of the 1937 law entitled, "An act relating to, and regulating the manufacture, storing and possession of explosives; requiring permits for magazines and prescribing permit fees; and providing penalties," under terms of a House bill referred to the committee on mines and mining.

Another House bill would require the payment of partial disability caused primarily by silicosis, anthraco-silicosis and asbestosis. It has been referred to the committee on workmen's compensation.

South Dakota.—Among the enactments of the South Dakota legislature, which adjourned in March, are laws giving preference to South Dakota products in all public contracts, authorizing municipalities to sponsor W.P.A. street-improvement projects when 60 per cent. of the property owners involved petition such improvement, authorizing the state cement commission to explore manganese deposits in the state in coöperation with the state geologist and the school of mines, and providing that profits of the state cement plant in excess of the requirements for operating expenses and bond and interest requirement shall be placed in the state general fund and used exclusively for concrete pavement of trunk highways.

The sole labor measure that survived the session gives the unemployment-compensation commission a lien on property when an employer fails to pay his unemployment contributions.

Tennessee.—Organized labor's effort to gain the enactment of a state wage-hour law failed when final action on the bill could not be taken before the close of the session.

Utah.—The legislature approved a $25,000 appropriation for continuing a study of occupational diseases.

Bills that failed of passage sought to make occupational diseases compensable, to permit state governmental agencies to accept bids of Utah firms or industries if they are within 5 per cent. of lowest bid from outside firms, and to refund the tax on gasoline used in stationary engines, tractors or for other non-transportation purposes.

West Virginia.—The legislature, in the closing hours of its session, buried a proposed wage-hour law in committee. At no time during the session was it considered that the measure had a chance of passage. Although given a hearing by the House judiciary committee, it was not brought to the floor for a vote.

Wyoming.—A wage-hour bill, while reported out by a Senate committee without recommendation, did not come upon the calendar for a vote prior to adjournment.

Magnesite Output Lower as Demand Declines

The magnesite industry was hard hit in 1938. Compared with the preceding year, the apparent consumption in the United States of dead-burned magnesite dropped 54 per cent., caustic calcined was off 31 per cent., and sales of crude were cut 52 per cent. Production of crude magnesite from domestic mines together with the products of the new seawater plant in California, aggregated only 97,000 short tons, the lowest quantity reported since 1932, and the imports of calcined magnesite products showed a parallel decline. The Bureau of Mines reports that shipments of domestic dead-burned magnesite, the leading item, were only 38,738 tons in 1938 as against 83,204 tons in 1937 while imports dropped to 24,990 tons from 56,021 tons. These reductions, respectively 53 and 55 per cent., exceeded the 44 per cent. decline in production of open-hearth steel, following the usual pattern of refractory products sales which are more sensitive than consuming industries to an oncoming recession and do not pick up again until well along in the ensuing recovery.

Prices of magnesite products held up fairly well although the slight gains made during the preceding two years were cancelled. The average values realized on domestic sales of crude, caustic calcined, and dead-burned, as calculated from returns furnished the Bureau of Mines by the producers, were $13.42, $30.88, and $18.87 per ton, respectively; corresponding figures for 1937 were $14.96, $31.04, and $19.21.

The new seawater plant of the Westvaco Chlorine Products Corp. at Newark, Cal., *(P & Q, May, 1938—p. 48)* was operated successfully in 1938, its products being sold throughout the year to precisely the same customers who formerly purchased material from the company's mines. The products are so nearly identical from the standpoint of performance that certain users may not even have realized the source of the material they received. At Chewelah, Wash., the Northwest Magnesite Co., with the cooperation of the Bureau of Mines, has undertaken the benefication by froth flotation of the magnesite-bearing waste hitherto rejected in its quarrying operations and is also perfecting processes for electrothermal smelting of magnesium metal.

By W. E. TRAUFFER

Wisconsin Producer Finds Portable Plants Ideal for Highway Jobs

COMMERCIAL aggregates producers in Wisconsin and a number of other states have found that the only way to compete with contractor- and independently-operated portable plants is to operate portable plants themselves. Their superior knowledge of, and wider experience in, aggregates production give them an advantage over their competitors in getting the business and in producing high-grade material economically. A permanent plant located near a center of consumption together with one or more portable plants which can be sent out to meet temporary demands in outlying territories make a combination hard to beat.

The portable plant in full operation. Truck at left is being loaded with road gravel and the one at right with waste sand.

A view of the plant showing the elevating drum, grizzly, hopper and feeder. At the left is the field conveyor and its chain suspension.

The ⅝-cu.yd. gasoline shovel which loads sand and gravel into a hopper at the end of the field conveyor.

The Deppe Lumber & Produce Co., Baraboo, Wis., has for years operated a permanent plant for the production of crushed stone and agricultural limestone for the market in and near that community. For many years the company has also operated portable plants for the production of aggregates for highway contracts. Later highway contracting was added to its activities. The company has leases on several gravel and stone deposits in Sauk County where most of its work is done. Stock-piles are built up at these deposits for making deliveries during the winter. Stock-piles are also maintained at the company's yard in Baraboo, where a stock-pile loader is used to load trucks.

In May, 1938 the company purchased a Wisconsin Foundry & Machine Co. Badger No. 39 Special portable crushing-and-screening plant. This was set up at a sand-and-gravel deposit about 5 mi. southeast of the Wisconsin Dells to supply aggregates for secondary-road work in that section. Contracts supplied from this pit totaled 18,000 cu. yd. The deposit averaged about 50 per cent. sand, of which about two-thirds was wasted. The gravel ran up to 5 in. in size with about 50 per cent. over the specified maximum of ⅞ in.

A Byers Model 62 gasoline shovel with a ⅝-cu. yd. dipper drops the material into a small hopper from which a reciprocating plate feeder transfers it to a 24-in. by 24-ft. inclined field conveyor. The material is then discharged on a sloping-bar grizzly with 8-in.-square openings which rejects all the gravel over 8 in. in size. Material going through the grizzly into the plant hopper is delivered by a 24-in. by 6-ft. belt-feeder into a 9-ft. diameter revolving drum, which is set at right angles to the axis of the plant, and serves the purpose of an elevator. The drum is 2 ft. wide and runs on four rubber-tired rollers. Lifters or buckets inside the drum discharge the sand and gravel on a 30-in. by 26-ft. inclined conveyor, which feeds a 4-ft. by 8-ft. Productive Equipment Co. Selectro 3-deck screen.

Material retained on the top deck of this screen is discharged into a 9-in. by 36-in. Badger roller-bearing jaw crusher. Material retained on the second deck drops into a 30-in. by 16-in. Badger double-roll crusher with corrugated rolls. The products of both crushers

The belt-conveyor which carries materials from the drum elevator to the screen.

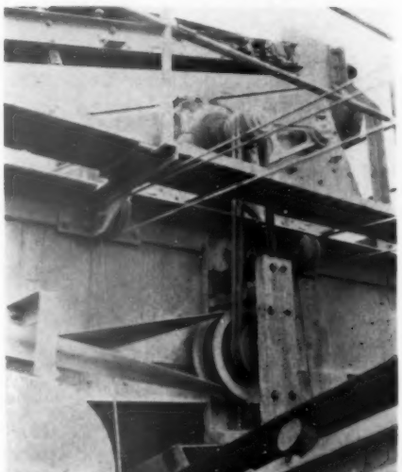
are discharged on a 24-in. by 12-ft. conveyor which returns them to the revolving drum, forming a closed circuit with the screen. The material retained on the 5-ft. bottom deck of the screen is road gravel, and what goes through this deck is sand. Both materials usually drop into separate hopper compartments but they can be combined in any desired proportions.

Two 24-in. by 20-ft. boom conveyors, one on each side of the plant, are used for truck loading. One conveyor can be used for sand and one for gravel, or both conveyors can be used for a mixed product. For the secondary-road job one conveyor was handling a road mixture of gravel and sand and the other conveyor handled the waste sand.

Ten trucks were being used to deliver the output of the plant at the time of the writer's visit. The output averaged about 90 cu. yd. per hr., of which about 60 cu. yd. was specification gravel. The remainder was excess sand which was being wasted. According to W. W. Deppe, secretary and operating manager, the use of a larger power unit would considerably increase the capacity of this plant.

The belt-conveyor and the 3-deck vibrating screen which does all sizing.

The power unit operating this plant is a 75-hp. Waukesha gasoline engine although a 90-hp. or 100-hp. engine is recommended by the manufacturer of the plant. A flat belt from the engine drives the jaw-crusher flywheel and the crushing rolls are driven from the jaw-crusher shaft through two stands of 1½-in. roller-chain running in oil. A countershaft is also driven from the crusher shaft. From this countershaft the drum, plant conveyor and feeder are driven. A 12-tooth sprocket engages a 96-pin gear on the drum. The vibrating screen is driven through two strands of Gates V-belts. A Gates variable-speed pulley on the screen shaft



The V-belt drive of the vibrating screen which has a variable-speed pulley.

provides a speed range of from 900 to 1,800 revolutions or vibrations per min. The usual operating speed for the screen is 1,250 r.p.m. The field conveyor is driven by a Wisconsin 4-cyl., 12-hp., air-cooled engine.

This plant weighs 69,000 lb. without the field conveyor. It is mounted on six wheels, each equipped with two 12-in. solid-rubber tires. The main frame is made of 15-in. I-beams. The three tubular steel axles are 5 in. in diameter. There are brakes on the four rear wheels and the two rear axles are independently sprung. New departure Sealed-for-Life anti-friction bearings are used on the drum rollers, the belt tightener and for all conveyor head and tail pulleys and idlers. All the other bearings are SKF self-alining anti-friction bearings. When in operation the plant is steadied by two jacks under its frame.

According to Mr. Deppe, this plant can be moved to a new location in the pit in 20 min. When moving to a new deposit it can be made ready for moving in 1 hr. and can be set up in a new location in 1½ hr. It is hauled by one of the company's 5-ton International trucks, which Mr. Deppe says attains a speed of 20 mi. per hr. at times.

The company also has a portable washing plant, which is used in conjunction with the crushing-and-screening plant when concrete aggregates are produced. This washing plant is used in the pit when water is available. Otherwise it is set up at the nearest source of water and the product of the preparation plant is hauled to it for washing before delivery.

The equipment used for the manufacture of limestone products at the company's quarry include an 8-in. by 36-in. Universal Crusher Co. jaw crusher, a set of 24-in. Wisconsin crushing rolls and a Robins vibrating screen. This plant produces crushed stone, limestone chips for seal-coating on black-top roads and agricultural limestone.

Phosphate-Rock Output Has Slight Decline

Retreating from the third unsuccessful attempt in the past three decades to penetrate decisively its apparently well-established 4,000,000-ton ceiling, shipments of domestic phosphate rock fell off, in 1938, about 200,000 long tons. For 30 years domestic phosphate-rock shipments have fluctuated between a lower limit of 2,000,000 tons and a top of 4,000,000 tons, their horizontal trend line being roughly 3,000,000 tons. Notwithstanding immense reserves, an excess of productive capacity, and an adequate supply of labor, the growth of the industry has been checked by a seemingly stabilized export and domestic demand.

Shipments from American mines in 1938, as reported by producers to the Bureau of Mines, totaled 3,739,238 long tons valued at $12,894,180. Exports rose slightly to 1,140,841 long tons, less than a third of the total shipments, and were valued at $6,637,638, more than half of the value of the entire production. Imports were only 7,006 long tons, valued at $80,539, coming principally from Curacao and French Oceania. The apparent quantity of phosphate rock available for domestic consumption in 1938, 2,605,403 long tons, was therefore about 300,000 tons less than in 1937, contra-indicating any increase in the rate of increase of domestic consumption, and confirming the decreasing rate indicated by the Bureau of Mines' logistic curve as published in the 1938 edition of *Minerals Yearbook*.

SAFE PRACTICE IN HANDLING WIRE ROPE

THE uses for wire rope in quarries and other open-pit workings often subject the ropes to severe treatment. Material-handling machines, like shovels, cranes and drag-lines, frequently subject the lines to bending action over small sheaves and drums, to the damaging influences of reverse bending, to jerking, and to considerable abrasion. Lines used on dipper and hydraulic dredges must encounter corrosion also. Cableway drag-lines and scraper drag-lines bring various harmful forces into play in varying degrees. On such equipment as aërial cableways and incline haulages wire rope usually meets easier conditions, although on many particular installations there are special conditions that take rather heavy toll of rope life.

In general it may be said that ropes which suffer most because of the conditions of service are ropes that create the greatest safety hazards. Ropes of comparatively short working lives are necessarily losing strength continually at a more rapid rate than ropes in easier services. Greater care must be taken to see that any required safety factors are maintained. In cases where ropes are used to the point of destruction, every provision should be made to assure that the parting of lines at work shall have the least opportunity to injure men working close to them.

It has happened many times that the cost of a parted wire rope itself was the least important feature of the occurrence. Too often the freed strands and wires, thrashing around erratically to rid themselves of the stresses under which they lay in the rope, have put out workmen's eyes and have caused the painful injuries that have many times necessitated amputations and caused deaths. Too often single broken wires in a line that is still serviceable have torn workmen's hands, causing blood poisoning and the loss of a limb or a life. Too often a line that has been kinked at some time has parted unexpectedly and injured men whose work was associated with the duty of the line.

Beginning with the last of these considerations—the kinks that can cause an apparently perfect line to give way suddenly and when least expected—every care should be taken to prevent kinks from forming in a line at any time. Once a line has been kinked it is unfit for further use. At the point at which the kink has occurred the normal functioning of the rope wires and strands is made impossible. The wires in the strands and the strands in the rope can not slide along one another as they should, when the affected section of rope is bent over sheaves and drum. As they are unable to accommodate themselves to the bending action by sliding normally they meet the situation by bending the section back and forth at the kink itself with what we may call a hinge effect. This action on the individual wires involved in the kink quickly causes metallic fatigue and failure of the wires.

Pre-formed rope at left, remains smooth in severe service while internal stress causes "porcupining" on ordinary rope.

The formation of kinks should be especially guarded against at the time the rope is removed from the reel or coil and is installed on the working equipment. It must be recognized that some ropes kink more readily than others. Non-preformed ropes are more "lively" or "cranky" than preformed ropes, particularly in Lang lay. When these "lively" ropes are used, it is necessary to avoid the formation of loops that are later pulled down into hard kinks.

The preforming of a wire rope removes the kinking tendency because it relieves the individual wires of the stresses from which they can partially relieve themselves only by throwing the rope into a loop. Because the preformed rope does not kink it contributes an important safety influence at the time it is installed. Incidentally, a new preformed rope distributes the load equally to all its strands during the critical period of early use when initial tensions are seating the strands of other ropes more evenly on the core.

Another wire-rope safety hazard mentioned is the flying apart of the wires and strands of some ropes when the rope itself parts. This action goes back to the same cause that makes wire ropes kink—an attempt to relieve internal stresses built up in the rope body at the time of manufacture. When these stresses are removed, as part of the rope-making process, the line does not fly apart at the ends. A rope freed of internal stresses at the time it is made will maintain its integrity in the two sections that are created by a break. The wire ends tend to remain in the rope body. For this reason a preformed wire rope is far less likely to injure workmen, when it is parted under tension.

Another prolific cause of injury to workmen is the "porcupine" wire that occurs in some ropes when outer wires break at the crown as a result of abrasion, or fatigue, or outside violence. These wires, often needle-pointed, stand out sharply from the rope body to tear men's hands even through the stoutest gloves. In many cases it is necessary for men to come in contact with these "porcupine" ropes; in other cases the contact may be due to carelessness or unavoidable accident. In any event there is great likelihood of serious injuries.

To explain why "porcupine" wires occur in a rope, it is necessary to go back to the same cause that underlies the two other sources of wire-rope accidents discussed—internal stress. When any outer wire of a rope breaks, it will, if under stress, spring away from the surface of the rope. If the wires are not under stress they will lie in the same position they occupied before the break occurred. Thus, a preformed rope, freed of the stresses that cause "porcupining," can not present the danger points that are ever likely to occur in a non-preformed rope.

In concluding this brief discussion of safety with wire rope it is good to recall an introductory remark we made. This was that ropes which lead comparatively short working lives for any cause are ropes that usually create the greatest safety hazards. Anything, then, that can be done to increase the service lives of ropes will help those ropes maintain a proper factor of safety for a longer time. Increasing resistance to bending fatigue, for example, may be what is required in a particular case to provide longer rope life and a proper factor of safety for a longer time. High resistance to bending fatigue is one of the notable operating features of the preformed rope. For this general reason, as well as for the more specific ones already enumerated, the use of preformed wire rope provides greater safety for workmen.

Personal Mention

CHARLES H. MAKINS, head of the Makins Sand & Gravel Co., Oklahoma City, Okla., has been named a member of the Oklahoma Public Welfare Commission by Governor Phillips.

HARRY D. JUMPER, engineer of specifications, Consolidated Rock Products Co., Los Angeles, Cal., who attended the recent conventions in Cincinnati and Chicago, stopped at Detroit and took delivery on a new Dodge coupe which he drove back to Los Angeles.

CHARLES B. GAGER, son of the founder of the company, has been made president of the Gager Lime Manufacturing Co., Chattanooga, Tenn., succeeding the late James M. Gager who died Jan. 30 of this year.

L. A. WAGNER, chief research chemist of the Missouri Portland Cement Co., addressed the members of the K. C. Engineers Club at a luncheon meeting at the Hotel President in Kansas City, Mo., recently.

BERT E. MANLEY, who started with the Hawkeye Portland Cement Co., Des Moines, Ia., as a stenographer, has been named secretary and general manager of the company. He had been acting general manager for several months.

WALTER COMPTON, an accountant for the Lone Star Cement Corp., has been transferred from Bonner Springs, Kan., to the Kansas City, Mo., offices.

GEORGE D. FRAUNFELDER has been appointed chief sales engineer of the Easton Car & Construction Co., Easton, Pa. Mr. Fraunfelder has been with the Easton company since 1914. During this time he has held many responsible positions and has worked out of the various branch offices of the company as well as the home office.

C. A. SHACKLETTE has been appointed sales representative in southern Illinois and Indiana, and western Kentucky, by the Union Wire Rope Corp., Kansas City, Mo. He will maintain his headquarters in Owensboro, Ky.

OTHO M. GRAVES, president of the General Crushed Stone Co., of Easton, Pa., will serve during the current year as vice-chairman of the Relation of Government to Industry Committee of the National Assn. of Manufacturers, according to announcement of committee appointments in New York City Feb. 27 by Howard Coonley, association president.

H. K. WORTHINGTON, located at the Muncy, Pa., offices of Sprout, Waldron & Co., has been made district sales manager for the state of New York, succeeding C. L. BEVIER.

DEL PALMER who has been a member of the firm of the Wichita Flint Gravel Co., Wichita, Kan., has sold his interest to his partner, GRANT STANNARD. Mr. Stannard will continue to operate the concern.

LEON B. THRASHER, of Lake City, Fla., formerly division engineer of the Florida road department, is the new engineer-director of the Florida Limerock Assn. Mr. Thrasher, who has seen 20 years in the service of the state road department, was chosen because of his wide technical experience in the use

MARMON-HERRINGTON
All-Wheel-Drive FORDS

"*Performing Fools*" IN
SAND, DIRT, MUD OR SNOW

• No wonder their owners call these trucks *"performing fools"!* To see them plough through sand, dirt or mud almost up to the hub caps is certainly an eye-opener for the operators of other trucks. To watch them climb steep, soft grades and hills with ease, and find sure, firm footing on snow-filled and ice-covered highways is almost beyond belief.

But Marmon-Herrington *All-Wheel-Drive* Fords are not only amazing in performance. Their ability to take punishment and stand up under the most difficult service is just as surprising. With power and traction distributed to all wheels, load burdens are distributed too, and less strain and stress is placed on engine and chassis. Tires wear longer, and fuel is saved. You needn't fear the possibility of driving the axles out from under *these* trucks!

See us at the Houston Oil Show

We convert all standard Ford trucks, commercial and passenger cars to *All-Wheel-Drive*, and build a complete line of extra heavy duty *All-Wheel-Drive* trucks with load capacities up to 25 tons. Write for literature. Cable address . . . MARTON.

MARMON-HERRINGTON COMPANY, INC.
INDIANAPOLIS, INDIANA, U.S.A.

Leon B. Thrasher

of limerock as Florida's best natural road-material base and because of his enviable reputation in professional engineering circles. His headquarters are in Ocala. Under Mr. Thrasher's direction, the Florida Limerock Assn. will renew its educational program, dormant for several years.

JOHN Z. HATFIELD, until five years ago vice-president of the Fanwood Stone Crushing & Quarry Co., observed his 75th birthday anniversary in late February at his Scotch Plains, N. J., home with the comment, "I shouldn't mind living another 75 years." He was active for more than 40 years in the stone-crushing and quarry business which he founded with William Weldon.

KARL PREIS, a German refugee now located in the United States, is seeking a market for a ready-mixed stucco product which he calls "sparkle-stone finish" made from Portland cement and natural and artificial aggregates. He may be reached at 5048 Blackstone Ave., Chicago, Ill.

W. A. MAXWELL, JR., president of the Colorado Fuel & Iron Corp., Denver, Colo., announces the transfer of supervision of the company's limestone quarries to L. F. QUIGG, new vice-president of the corporation.

REUBEN J. MORSE, 63, vice-president and general manager of the Ideal Cement Co., who died Feb. 26, was buried in Denver. Mr. Morse, a native of Colorado and long a business and civic leader of Denver and Colorado, died in a Denver hospital after an operation. For 35 years he was associated with Charles Boettcher in the development of the Ideal Cement Co. and its subsidiaries, the Colorado Portland Cement Co., the Three Forks Portland Cement Co., the Nebraska Cement Co., the Oklahoma Portland Cement Co., and the Union Portland Cement Co. Surviving are his wife, Elizabeth H. Morse; two sons, Whitney G. Morse of Honolulu, and Donald A. Morse, assistant superintendent of the Colorado Portland Cement Co. plant at Portland, Colo.; a daughter, Mrs. Madeline Griffith of Los Angeles, Cal., and a sister, Mrs. George Minshell of Denver.

EMIL STROH, 75, president of the Wabash Portland Cement Co., Detroit, Mich., died last month at his home, in Grosse Pointe, Mich.

OSWALD HANSEN, Reno, Nev., sand-and-gravel contractor, died last month at the age of 59. He was a native of Denmark and had been a resident of Reno since 1903.

W. LEONARD CATEN, 45, vice-president and sales manager of the W. H. Loomis Talc Corp., Gouverneur, N. Y., died March 3 at his home in Gouverneur after an extended illness. He was stricken with a cerebral hemorrhage while on a fishing trip in 1935 and never fully recovered. He had been connected with the company for 13 years.

EDWARD M. GRAY, 72, president of the Des Moines Sand & Fuel Co. and the Central Iowa Sand & Gravel Co., died recently at his Des Moines, Ia., home. He had been an active figure in the aggregate business in Iowa for 20 years, having served several terms as president of the Iowa Aggregate Producers Assn.

Edward M. Gray

EFFECTIVENESS
3 to 1
LIKE THE TRI-MOTORED PLANE • • • •
THE Leahy HEAVY DUTY
With "TRI-VIBE"
VIBRATING SCREEN
the latest LEAHY Type C Screen has Tri-Vibe, a new and exclusive feature that triple powers every square inch of the free-swinging screen jacket with the super-energy of dynamic LEAHY differential vibration.
With every mesh in motion, blinding is prevented and the openings kept clear. Result: Greater capacity and uniformity in fine screening than ever before—yet only ½-hp. does the job.
Write for Bulletin 14-H
THE DEISTER CONCENTRATOR CO.
911 Glasgow Ave., Fort Wayne, Indiana
Spray Nozzles • Duplex Washing Tables • Leahy Screens • Constriction Plate Classifiers
PROFIT-PRODUCING EQUIPMENT

JOHN M. BUCKLAND, president of the National Slag Co., Allentown, Pa., died recently at his home after a brief illness. He was 62 years old. Burial took place at his native city of Catasauqua, Pa.

GEORGE F. BAYLE, 78, president of the Glens Falls Portland Cement Co. from 1905 until his retirement in 1933, died March 10 at his home in Glens Falls, N. Y.

OLIVER H. BINUS, 87, who served as manager of the Logansport, Ind., plant of the Casparis Stone Co., now a unit of the France Stone Co., for 32 years, died at his home in Goshen, Ind., recently. He retired from active business with the stone company in 1926.

LOUIS A. SLATTERY, 52, vice-president of the Hudson River Stone Corp., New York, N. Y., died recently after an illness of three months.

Trade Literature

The New Line of Portable Compressors. 32 p. Ingersoll-Rand Co., New York, N. Y.

Sterling Speed-Trol Motors. 4 p. Sterling Electric Motors, Inc., Los Angeles, Cal.

Move Your Concrete-Mixing Plant to the Job. (folder). Erie Steel Construction Co., Erie, Pa.

The Super-Trough Conveyor. (folder). Conveyor Engineering & Sales Corp., Clifton, N. J.

Reliance Tachometers and Panels. 12 p. Barbour Stockwell Co., Cambridge, Mass.

The Link-Belt Roto-Louvre Dryer. 16 p. Link-Belt Co., Chicago, Ill.

Equipment for the Metallic, Nonmetallic and Associated Industries. 96 p. Allis Chalmers Mfg. Co., Milwaukee, Wis.

How to Make Portable Cable Joints. 16 p. General Electric Co., Schenectady, N. Y.

The Dual Packer-Head Pipe Machine—Model T. 4 p. Concrete Pipe Machinery Co., Sioux City, Ia.

Digest of Cletrac Tractor Features of Design. 36 p. Cleveland Tractor Co., Cleveland, O.

Buda-Lanova Diesel Conversion Units for Ford Trucks. 8 p. The Buda Co., Harvey, Ill.

Vulcan Better Tools. (folder). Vulcan Tool Mfg. Co., Quincy, Mass.

New Portable Bituminous Mixing Plants. 8 p. Hetherington & Berner, Inc., Indianapolis, Ind.

Permanent Steel Buildings. (folder). Butler Mfg. Co., Minneapolis, Minn.

A $500,000 order for drag-line excavators for delivery in Germany has been received by the Bucyrus-Monighan Co., a subsidiary of the Bucyrus-Erie Co., South Milwaukee, Wis.

THIS KIND OF STEEL MAKING PUTS *FIGHT* IN ROEBLING SCREENING!

IT TAKES strong, tough steel to give long, economical operation—under the severe BEATING of stone and gravel screening service.

That's why Roebling's *custom-method* of steel making contributes so greatly to the performance of Roebling Wire Screening. It's a method by which the steel is painstakingly made in special small open-hearth furnaces—each lot carefully watched and controlled—to assure strict uniformity and the desired high degree of resistance against wear and vibration.

To assure you of wire screening that will provide the utmost of service—Roebling controls every process of manufacture from steel making to final fabrication!

We invite your inquiry for further information. Roebling Wire Screening is made in a wide range of types and metals for all cleaning, grading and sizing services.

JOHN A. ROEBLING'S SONS CO.
TRENTON, N.J. *Branches in Principal Cities*

ROEBLING ABRASO SCREEN

TRADE JERSEY MARK

90 YEARS OF WIRE MAKING SPELLS THE DIFFERENCE

Adds to Magnetic Line

The Stearns Magnetic Mfg. Co., Milwaukee, Wis., makers of an extensive line of magnetic separators, magnetic clutches and brakes, has concluded arrangements with the Exolon Co., Blasdell, N. Y., whereby the Stearns organization will manufacture and sell Exolon machines. The Exolon Co. will also continue to manufacture and market its machines as heretofore.

The Stearns-Exolon magnetic separator, as it will be known, is designed for the treatment of material of high magnetic reluctance. The material is fed over a series of inductively magnetized rotors revolving in a magnetic field. The separator is so designed as to allow for increasing the number of magnetic zones to suit the kind of material being treated and also provides for the required capacity.

BACON FARREL CRUSHERS

Complete Plants Designed and Equipped. Screens, Elevators, Conveyors, Quarry, Sand and Gravel Plant Equipment. Engineering Service.

EARLE C. BACON, Inc.
17 John Street New York, N. Y.

Traffic News Digest

Legislation

New Bills.—Since the last issue of PIT AND QUARRY went to press several new bills have been introduced into congress. Senator Wheeler has introduced S. 1,310 and Representative Lea has introduced H.R. 4,041 in the house. These two bills are identical and would give the Interstate Commerce Commission increased regulatory power over the financial transactions of the railroads. Senator Wheeler is chairman of the Senate interstate commerce committee and Representative Lea is chairman of the house committee on interstate commerce.

Representative O'Neal of Kentucky has introduced H.R. 4,537, a bill which would take away the power of the Commission to determine the need for Federal regulation of the size and weight of motor vehicles.

H.R. 4,075 would amend paragraphs one and three of section 15 of the Interstate Commerce Act to give the commission jurisdiction over minimum as well as maximum rates over routes where one of the carriers is a water line.

Transportation Act.—A bill proposed by the President's Committee of Six, after having been checked by legal members of the staff of the commission with some changes in wording, was introduced in the House by Chairman Lea of the Committee on Interstate and Foreign Commerce and is known as H. R. 4,862. This bill will be the basis for a proposed Transportation Act of 1939 and hearings are being held before a sub-committee of the house committee on interstate and foreign commerce. So many objections are being made by shippers and carriers to various provisions of the bill that there is doubt as to whether a general transportation act can be passed at this session. No move has been made so far to introduce a companion bill in the Senate as chairman Wheeler of the senate committee said he would wait until the house had proceeded farther with consideration of their bill. Senator Wheeler proposes to introduce a bill which would provide for the regulation of all agencies of transportation by the Interstate Commerce Commission. This would include water, air, motor and rail transportation.

Through-Route Bill.—The bill which would give the commission power to prescribe through routes regardless of short-hauling carriers which was introduced as S. 1,085 in the Senate is being handled by a sub-committee of the Senate Interstate Commerce Committee. Hearings were begun on February 28. This legislation is favored by the Interstate Commerce Commission, the American Short Line Railroad Assn., the National Industrial Traffic League and some shippers. Opposition to the bill comes from Class I railroads. This bill was passed by the Senate on August 14, 1937, but was not acted on in the House.

Sectional Rates.—A number of bills have been introduced in both houses of Congress having to do with complaints on the rate levels applicable to various sections of the United States and proposing that Congress instruct the commission to remove alleged discrimination between the various sections. Hearings on bills coming under this grouping were held before the Senate sub-committee of the Interstate Commerce Committee and also before the House sub-committee. Witnesses appeared for groups of shippers, for individual shippers and for the various state governors or state utilities commissions. It is not likely that any legislation directing the commission as to the rules of rate making will be passed at this session. Perhaps a resolution will be offered and passed which will require the Interstate Commerce Commission to investigate various complaints on sectional rate discriminations. Many observers believe that the real purpose of these bills has now been accomplished. It was not expected that these bills would be passed by Congress but it did give proponents and their constituents an opportunity to air their views before representatives of Congress. It was felt by some that these hearings might have an influence on the Interstate Commerce Commission in considering rate levels in the various sections.

Recent I. C. C. Decisions

Cement.—In response to Fourth-section application 17,390 the Commission has granted authority to interested carriers to establish and maintain rates on cement from Norfolk and Newport News, Va., to destinations on the Durham branch of the Norfolk Southern, including Durham and Dunn, N. C., which are the same as the rates in effect over the short-line route but not lower than the rates in effect over such route and to maintain higher rates to intermediate points. I. C. C. F. S. O. No. 13,335, cement from Norfolk and Newport News, Va.

Gravel.—In order to meet water competition the commission has authorized the Seaboard Air Line to establish and maintain a rate on gravel from Montgomery, Ala., and points intermediate thereto to Fernandina, Fla., of not less than $1.60 a net ton and to maintain higher rates to intermediate points subject to the usual restrictions as to combination rates. I. C. C. F. S. O. No. 13,327 gravel from Montgomery, Ala.

Sand and Gravel.—The Kansas commission having failed to authorize the increased rates prescribed by the commission in the 15-per cent. case, an investigation was instituted and it was found that the rates on certain commodities in Kansas including sand and gravel and related articles were in violation of Section 13. The commission did not enter an order prescribing these rates allowing the Kansas commission to increase the rates if they desired to do so. Since the Kansas commission did not act the interstate commission has now ordered rates on sand and gravel and related articles increased to the level applying on like commodities to destinations in Kansas from origins in Kansas, Nebraska, Missouri and Oklahoma for interstate transportation. I. C. C. docket No. 28,070, Increases in Kansas freight rates and charges.

Wallboard.—The commission has granted

PERFORATED METAL SCREENS
FOR SAND, GRAVEL STONE, ETC.
Manufactured exactly to your specifications.
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.
Prompt Shipment
CHICAGO PERFORATING CO.
2435 W. 24TH PLACE CHICAGO, ILL.
Telephone CANAL 1459

fourth section relief on wallboard between points in the Carolina territory and points in trunk line and New England territories. Rates are to be constructed on the basis of 22½ per cent. of the constructive first class rates. I. C. C. F. S. O. No. 13,352, wallboard from and to Carolina territory.

Examiners' Reports

Asphalt Rock.—On shipments of asphaltic sandstone, processed, in carloads from Bowling Green, Ky., to Harrisburg, Pa., the carriers charged $164.00 a car based on 90 per cent. of the weight capacity of cars furnished at the carriers convenience in lieu of smaller cars ordered. The charges were based on the rate of $3.90 plus 20c emergency charge and a weight of 80,000 lbs. per car. Examiner Leland F. James proposes that the commission find these charges unreasonable and that the failure of the carriers to publish a rule governing the situation such as this wherein a larger car than ordered was furnished was an unreasonable practice. He recommends that reparation be awarded in the amount of the difference between the charges which were paid and the charges which would have accrued on the basis of an 80,000 pound minimum car. This amounts to $41.00, with interest. I. C. C. docket No. 28,084 Kentuck Rock Asphalt Co., Inc. *v.* L. & N. *et al.*

Sand.—Examiner Harold M. Brown recommends that the commission find the carload rate of $2.20 a net ton charged on sand shipped on April 12, 1937, from Talbird Siding, N. C., to Lynchburg, Va., unreasonable to the extent it exceeded, exceeds, or may exceed $1.50 a net ton. I. C. C. docket No. 28,089, Lynchburg Chamber of Commerce Traffic Bureau for Campbell Payne Co., Inc. *v.* N. & W. *et al.*

Sand and Gravel.—In connection with the rates on sand and gravel from points in Illinois, Indiana and Wisconsin to certain connecting lines deliveries in the Chicago switching district a hearing was held jointly with the Illinois Commerce Commission. Examiner Burton Fuller in his report said that while it was true that a competitive situation existed within the southern portions of the Chicago switching district caused by truck and water traffic on competitive materials and that this situation was of serious concern to all rail shippers, dealers and carriers; any general adjustment of rates to meet this competitive situation would have to be made by considering the entire district and all of the deliveries affected by the competition after giving all parties full opportunity to be heard. In the present case the complaint referred only to restricted issues and the record was so restricted that a decision governing the entire competitive situation could not be made. He therefore suggested that the complaint be dismissed. I. C. C. docket No. 28,064, E. A. Keller & Sons, *et al.*, *v.* Alton, *et al.*

Soapstone and Talc.—The complaint of the southern governors involving rates on various commodities within the south and from the south to the north was heard by Commissioner Lee and Examiner Corcoran. While the complaint involved rates in general the commissioner and examiner in their proposed report found that the rates on certain commodities were out of line. The only commodities in this list which are products of the non-metallic mineral industry are stone, soapstone and talc. The report states that a level of rate higher than that applying within the north would very likely interfere with and prevent a freedom of movement within the south and from the south to the north as contemplated by the interstate commerce act. According to the report, stone, soapstone and talc were not moving freely from the south to the north over all rail routes at the present rate and would not move freely at rates higher, distance considered, than those applicable within the north. The southern carriers were generally in favor of the aims and objectives of the complaint. Northern carriers, northern governors and other northern interests opposed the complaint in all respects. The report pointed out that it was a fact that the general average of rate is not higher within the south than within the north.

New Complaints Filed

Crushed Stone.—Alleging violation of Section 1, reparation is requested in a complaint covering the rates and charges on crushed stone from Security, Md., to Gettysburg and Guldens, Pa., made in April, 1938. The complaint is filed by R. V. Cearfoss, 285 Madison Ave., New York, N. Y. I. C. C. Docket No. 28,197, North American Cement Corp., New York, N. Y. *v.* Western Maryland Railway Co.

Ground Limestone and Lime.—Alleging undue prejudice against the complainant and undue preference for shippers in Ohio, a complaint has been filed attacking the rates on ground or pulverized limestone and lime between points in Pennsylvania and points in New York by Horace B. Garlick, 295 Union Ave., Williamsport, Pa. In I. C. C. docket No. 28,195 Whiterock Quarries, Inc., Bellefonte, Pa., *v.* Pennsylvania *et al.*

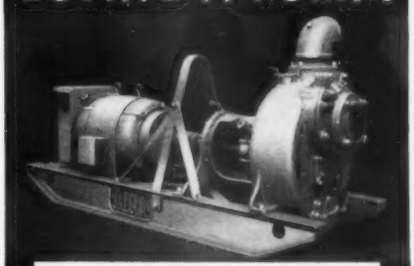
Lime.—In cases involving the rates on lime from central territory to the east, rates were prescribed by the commission on a mileage scale basis with groupings of origin points and destination points allowed. The carriers are now asking the commission to modify its order in docket 19,957, Northwestern Ohio Lime Manufacturers *et al. v.* Pennsylvania *et al.*, and other cases joined therewith, so as to work out a destination grouping that will conform with the new grouping made by the commission in docket No. 15,879, Eastern Class Rate Revision, as reported in 164 I. C. C. 314. This is to apply on lime rates from points west of the Ohio-Indiana state line to give shippers from points west of that line the benefit of reductions in the level of rates established in the 19,957 case. The carriers say that the proposed adjustment of destination groupings is necessary to eliminate fourth section difficulties unless the new rates and the adjustment from origins in Ohio is also tied up with the class rate grouping. I. C. C. docket No. 19,957 Northwestern Ohio Lime Manufacturers *et al. v.* Pennsylvania *et al.*

Foreign Developments

Effect of Temperature on Strength of Cement

The publication of Morbelli's new method for the production of asbestos-cement products and Eklund's for the manufacture of gas concrete raised a number of questions for scientific investigation. These inventors' process, in which it is possible to use a cement to which three times its own weight of quartz flour is added first of all, raises the question of the course of the reaction in the autoclave. The products formed in the autoclave from mixtures of cement and quartz flour consist of

BUYING A PUMP?



JAEGER "Sure Primes" Supply Water at Lowest Known Cost . . .

Combine 100% automatic priming with the huge water volume and low power requirement of high efficiency centrifugals. Meet any demand for gravel washing up to 220,000 G. P. H.

Compact, simple, noted for long-life operation. All sizes to 10", gas or electric, on wheels or base. Get catalog, prices and performance data.

THE JAEGER MACHINE CO.
602 Dublin Avenue, Columbus, Ohio

JAEGER

BLAST IT WITH HI NATIONAL EXPLOSIVES

POWDER NATIONAL COMPANY

NEW ADVANCES ON THE BLASTING FRONT CONSOLIDATE "NATIONAL" POSITION

NATIONAL technicians have just developed SIX Special AMMONIA DYNAMITES that expedite blasting operations. Also TWO high stick count gelatin types are now available.

Permissibles, Nitroglycerine, Gelatin
Ammonia Dynamites
Flo-Free Dynamites
Blasting Supplies
TECHNICAL SERVICE on Request

NATIONAL POWDER CO.
Executive Offices Plant and Sales Offices
DUKE CENTER, PA. ELDRED, PA.

compounds which show no alkaline reaction even in the phenolphthalein test, indicating a combination of lime greater than in the ordinary hardening, proceeding at least to the hydrated monocalcium silicate, the hydrated dicalcium aluminate and the hydrated dicalcium ferrite, but possibly giving rise to a silicate of still lower lime content or even free aluminum hydroxide and free iron hydroxide.

But the proof of the formation of hydrates very low in lime content is not sufficient to explain the extraordinarily high admixture of quartz flour which Morbelli and Eklund found possible. The solution is revealed by investigation of the chemical equilibrium which sets in with very high quartz flour admixtures and with the use of high-lime Portland cements after some 5 hr. at 180 deg. C.; even finely ground quartz flour reacts only at the surfaces of its particles with the lime of the cement; consequently there must be a very large surface and therefore a very high admixture of this substance to allow the reaction, hindered by the formation of gel, to proceed to complete consumption of the available quantities of lime. In the case of cements of high lime content, with a tendency to unsoundness, this reaction is at first disturbed by the loosening of the structure, but this disturbance is less noticeable as the excess of silica increases. These considerations of the mechanism of the reactions that take place in the autoclave lead to the question of the best mixing proportion between cement and quartz flour and the best chemical composition of the cement.

The investigations carried out have shown that the mixing of quartz flour with cement in the temperature range up to 100 deg. C. quickly leads to a diminution of strength and that the possible tendency to unsoundness is not appreciably lessened by such "thinning" of the cement. But in the range of the autoclave temperature, a good cement can take up to four times its own weight of quartz flour admixture without a lessening of strength. This phenomenon is explained by the fact that such an intimate "interlocking" takes place between the gel-like reaction products and the corroded remnants of the quartz particles that the gel masses and quartz particles form a uniform "cement glue".

This "interlocking" also takes place when ordinary standard test specimens of cement and coarse standard sand are hardened in the autoclave. It is the explanation of the often sudden increase in temperature observed when test specimens which have shown decreases in strength in the accelerated tests at boiling temperature are compared with autoclave tests.

The selection of a suitable cement is just as important as the choice of the correct proportion for mixing. The fact that the quartz flour reacts in the autoclave with the cement and, when present in great excess, combines large amounts of lime, could indicate that a cement as high in lime as possible must be particularly suitable. The investigations conducted show that the opposite is true, and that, as in the ordinary handling, in the Morbelli and Eklund process the best cement is the one which appears best in the standard tests; the hardening of mixtures of cement and quartz flour in steam imposes even higher requirements as to constancy of volume than hardening under ordinary conditions and the standard tests.—Dipl.-Ing. Karl Würtenberger in *Tonindustrie-Zeitung* 62:787-790, 886-888, 953-956, 962-964, 1005-1007, 1072-1074, 1084-1086, 1106-1107, 1130-1132, 1140-1141; 1938, Nos. 72/73, 79, 85, 86, 90, 96, 97, 99, 101, 102 (Sept. 12 to Dec. 22, 1938, *passim*).

WE GAVE PIPE
a new twist

WE gave it this new twist a long time ago. It was the spiral twist—and it proved to be a revolutionary idea. The spiral seam gave light wall pipe greater rigidity and strength than it had ever had before. Year by year we have improved it—strengthened the seam; developed protective coatings for all services; broadened the range of sizes, wall thickness, and joints.

FOR your dredging lines, pontoon lines, sand and gravel lines, water lines and all similar services, this time-tested, but ever-modern pipe will handle the job at half the installed cost of any other type of pipe that you could use.

TAYLOR FORGE & PIPE WORKS
General Offices and Works: Chicago, P. O. Box 485—New York Office: 50 Church Street

ASK FOR CATALOG 36

Occupational Diseases and the Law

Dust Injuries

Tennessee, Eastman Corporation v. Newman, decided by the Court of Appeals of Tennessee, Eastern Section, May 20, 1938; certiorari denied by Tennessee Supreme Court on October 15, 1938; reported at 121 S.W.(2d) 130. The plaintiff (in the trial court) was an employee of the Tennessee Eastman Corp. for approximately six years and, because of an alleged occupational disease contracted during his employment, he became disabled and was compelled to quit his work. His suit alleges that his disability arose from inhaling over a long period of time dust or small particles of sodium carbonate, commonly called soda ash, while unloading this chemical from railroad cars into receptacles provided by the company at its manufacturing plant, and that the company had violated its statutory duty in failing to protect him from the injurious effects of this dust, or chemical particles. The statute relied upon is Sec. 5340 of the Tennessee Code, which

among other things requires that in establishments where dusts, filaments or injurious gases that are liable to be inhaled by persons employed therein are produced, the employer must install exhaust fans, blowers with pipes and hoods, or contrivances or apparatuses by which dust, etc., may be expelled or controlled.

The dust arising from the hopper and permeating the surrounding atmosphere was not controlled by masks, which were used, since it continually seeped under the masks and entered the mouth, nose and eyes of the workmen. No attempt was made to install any system to take care of the dust. The court holds that the employer was not excused on the theory that the operation was an open-air operation where natural ventilation would expel the dust particles.

The company's claim that the act is in derogation of the common law and must be strictly construed, and that the court has no latitude in carrying out the primary purpose of the enactment, is denied on the ground that these principles are not applicable to the question under review, since the act only designated the means to a common-law end: under the common-law the employer is required to furnish the employee a safe place in which to work.

The evidence was held to prove that the employee was suffering from chronic bronchitis and other ailments of the respiratory organs, which were the result of inhaling dust particles over a long period of time, and that the inhaling of the foreign matter as a resultant cause contributed to, and was the primary cause of, the accompanying ailments of tonsilitis, pyorrhea, etc. His disability was consequently held to be an industrial ailment contracted in the course of his employment.

A one-year statute of limitations was also raised against the employee's suit. In answer to this the court lays down the significant rule that the tort was a continuing one and that the statute of limitations is not applicable. "The statute was enacted to prevent as far as reasonably possible the contraction of these occupational diseases; and they are of long duration from inception to discoverable disability, while the statute of limitations prescribes a short period. To restrict the recovery to the limitation period will in a large measure defeat the pupose of the humanitarian act, for the result will exempt the employers from civil damages for the wrongs inflicted in violation of law. . . . The court is of the opinion since the suit was instituted within one year of the disability and termination of employment ending the continuous tortious omission of duty by defendant, and the cumulative ill-effects thereof, that the statute of limitations is inapplicable, and plaintiff is entitled to recover full damages for the injury sustained."

The court further holds that when the statute was violated by the employer, the employee did not assume the risk, regardless of his knowledge, and recovery can not be denied on the ground of contributory negligence.

Tuberculosis

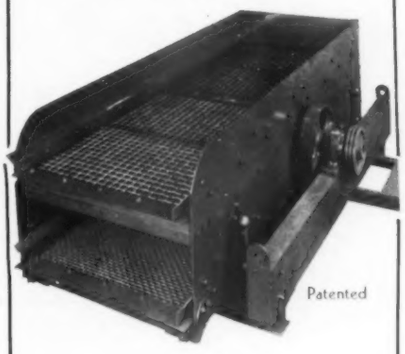
Bolosino v. Laclede-Christy Clay Products Co. et al., decided by the St. Louis (Missouri) Court of Appeals, February 7, 1939; reported at 124 S.W. 581. This was a proceeding under the Missouri Workmen's Compensation Law, Sec. 3299-3376, Revised Statutes of Missouri, 1929, being an appeal from the judgment of a lower court reversing a decision of Workmen's Compensation Commission.

The employee concerned filed a claim for compensation for an injury identified in the claim as "pneumoconiosis, broncho-pulmonary fibrosis and silicosis tuberculosis," alleged to have resulted from "working and breathing in a dust-laden atmosphere" on the premises of the employer. It was shown that the grinding and crushing of rocks and clay produced a considerable amount of dust; however, there was medical testimony to the effect that the employee was suffering from pulmonary tuberculosis wholly disassociated from silicosis or pneumoconiosis as a predisposing cause. The commission denied compensation on a finding that the condition complained of was not the result of an occupational disease arising out of and in the course of the employment. The Court of Appeals found that there was competent evidence to support this finding, and orders the court below to affirm the award denying compensation.

The court holds that tuberculosis in and of itself is not an occupational disease. "However, it is recognized that any factor which lowers the resistance of the individual or brings injury to his lung structure will render him susceptible to tubercular infection, and so it is that true occupational diseases frequently terminate in tuberculosis, in which event the employee's ultimate condition is to be considered upon the question of the amount of compensation that he shall receive. . . . But before tuberculosis may be included in the injury for which compensation may be awarded, it must first be shown that long continued exposure to the peculiar hazards of the employment brought on some pathology in the lung tissue which rendered the employee peculiarly susceptible to tuberculosis."

SECO

Vibrating Screens



Patented

With

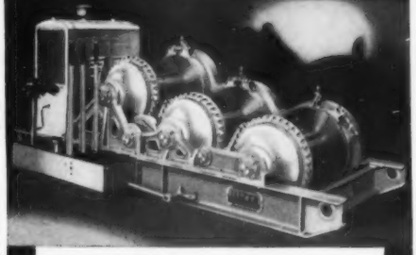
Controlled, positive circular motion, resulting in higher production, more accurate sizing and minimum maintenance cost.

Scientifically engineered and sturdily built, Seco represents the most advanced step in vibrating screen design.

Catalogue Upon Request

SCREEN EQUIPMENT CO., Inc.
9 Lafayette Ave. Buffalo, N. Y.

BUYING A HOIST?



JAEGER Touch Control Hoists—30 to 100 H.P. Offer You . . .

1: Giant Expanding Frictions, as on $15,000 Shovels, giving easy finger-tip control of loads.
2: Self-Aligning Anti-Friction Bearings standard equipment.
3: Accurately Balanced Drums.
4: Rigid Construction, Multi-Cylinder Power, Silent Chain Drive. 1 to 3 Drums (interchangeable). Gas or Electric.

Standardized construction (only 3 basic types for 30—100 H. P.) means big savings, lower prices. Get new Catalog.

THE JAEGER MACHINE CO.
602 Dublin Avenue, Columbus, Ohio

JAEGER

* Note: Obsolete Machines cost more to operate than these Modern P&H Excavators

P&H Model 855
2 yard Shovel

Where digging depends upon steady operation, P&H all welded construction of alloy steels gives you bigger production with lower costs for yardage and maintenance. Available in sizes up to 5 cu. yds. capacity; Gas, Diesel or Electric Power. Write for literature on the size you need. Harnischfeger Corporation, 4451 West National Avenue, Milwaukee, Wisconsin.

HARNISCHFEGER CORPORATION
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS P&H HOISTS · WELDING ELECTRODES · MOTORS

Exposure

Morris Metal Products Co. v. Industrial Commission et al., decided by the Supreme Court of Illinois, December 15, 1938; rehearing denied February 9, 1939; reported at 18 N.E. (2d) 899. The employee involved in this case had been a molder for about nine years. He started to work for the employing company in August, 1935. The Illinois Occupational Diseases Act was enacted March 16, 1936, and went into effect October 1, 1936. The employee was working for the company on October 1, 1936, and was discharged on November 30, 1936. During the interval from October 1 to November 30, he worked six days a week and also three Sundays, but not on Thanksgiving Day, so that out of the 61 days he worked 54 days. He filed his claim for compensation under the Occupational Diseases Act, claiming disability from silicosis. The objection was made that he had not been exposed to the hazard 60 working days; this claim was sustained by the arbitrator and the Industrial Commission, but was reversed by the Circuit Court of Cook County.

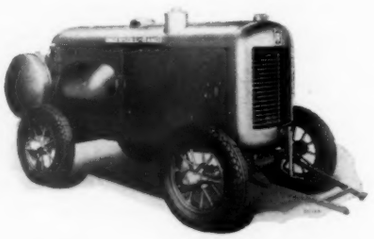
The only question for determination in the appeal was whether a proviso of Sec. 25 of the Occupational Diseases Act requires an exposure of 60 separate working days to justify a recovery. The Supreme Court, upon a review of the whole act to determine the legislative intent, rules that the words used in the proviso of Sec. 25 are to be used in determining the "last employer" but were not intended to create a period of 60 working days as an exposure in cases of silicosis and asbestosis. The judgment of the circuit court, accordingly, is affirmed.

The W. W. Sly Mfg. Co. of Cleveland, O., who has recently appointed the Snyder Engineering Corp., of 2444 E. 24th St., Los Angeles, Cal., as its representative in California.

New Machinery and Supplies

A new line of two-stage, air-cooled portable compressors has been introduced by the Ingersoll-Rand Co. A number of improvements have been incorporated. These machines are available in five sizes for actual capacities of 85, 105, 160, 210 and 315 cu. ft. per min. of air at 100 lb. pressure. They are powered either by Waukesha heavyduty industrial type gasoline engines or by Ingersoll-Rand type "H" oil engines.

Probably the most striking feature is the streamlining of the complete unit. Low center



New two-stage air-cooled portable compressor.

of gravity, smooth lines, and an excellent finish result in a practical unit of modern appearance. A bell-housing connection is used on all sizes, making compressor and engine practically one unit. The entire assembly is mounted on a sturdy pressed steel frame.

The air intake is now on top of the roof. A stronger, sectionalized radiator, having improved construction of sections and more rigid mounting is furnished.

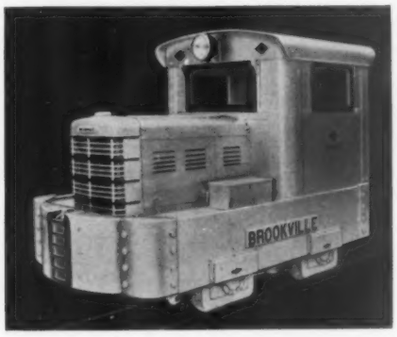
Thermostatic control replaces the adjustable curtain and automatically assures the correct cooling water temperature for the engine.

A more convenient location is provided for the air receiver and fuel tank, the latter being lead-coated, easy to fill and sufficiently large to hold a day's supply.

This large Marmon-Herrington all-wheel-drive truck and pole trailer with a load of 30,000 lb. of steel rails is being tested out in the sand dunes on the shore of Lake Michigan in northern Indiana before being shipped to Arabia. This is just one unit in a large fleet of Marmon-Herrington all-wheel-drive vehicles built for service in the new oil fields being opened up in the Arabian Desert and conditions in the sand dunes are said to approximate those in the desert where the vehicles are destined to be used, often hub-deep in sand.

• Locomotive

For more than 20 years the Brookville Locomotive Co., Brookville, Pa., has been building Ford-powered industrial locomotives. As the Ford engine itself has been improved and made more powerful, the Brookville locomotive also has been improved and increased in size. The



New Ford-engine-powered locomotive.

first were powered with the Ford Model T; the latest are powered with the new 85-hp. and 95-hp. engines. The present line includes models ranging from 2½ to 8 tons in size, in any gauge.

These locomotives are equipped with an all-speed reverse, which makes all forward speeds available in either direction; they have a dual-spring journal suspension, which makes possible higher speeds over poor track; and they are built with an indestructible steel frame. The complete power plant is made by the Ford Motor Co. and can be serviced at any authorized Ford service station; while the locomotive chassis is so rugged that it is guaranteed for six months against failure from all causes, including ordinary wear.

For service in localities where gasoline is relatively expensive, the Ford V-8 engine can be replaced with a Buda-Lanova or Hercules Diesel, in many of these models. Still larger models are furnished with International or Caterpillar gasoline and Diesel engines.

• Scrapers, Bulldozers

The outstanding Bucyrus-Erie 2-wheel and 4-wheel scrapers, bullgraders and bulldozers are now available in models specially designed to give peak performance with the fast, economical new International TD-18 TracTracTor.

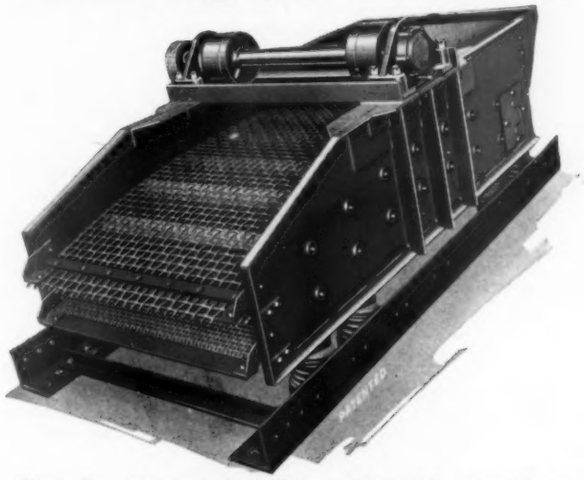
The M-81 4-wheel scraper with the "double-curve" cutting edge heaps the load regularly in all types of scraper material. Single-cable control lets the operator govern digging, hauling and dumping operations with a single lever, allowing him to spread loads accurately to meet job specifications.

To get dirt from difficult places and put it in difficult places, the H-74 2-wheel scraper teams up with the new TD-18. Like the smaller Bucyrus-Erie 2-wheel scraper, the H-74 dumps backward, and behind its wheels, like a truck. This feature is invaluable for building up fill, dumping into water over the end of a bank and also permits stacking the load or bulldozing it level. A simple, low-pressure hydraulic system controls the position for digging, hauling and dumping.

To complete the equipment to pair with the International TD-18, Bucyrus-Erie introduces a larger size bullgrader and bulldozer of the same design as the smaller models which have proved successful in the field. The bullgrader will sidecast to either side. When the angling adjustment is set for sidecasting, the equip-

REPEAT ORDERS
tell the whole story

Producers know that
THE DEISTER PLAT-O VIBRATING SCREEN
can be depended upon for day-in, day-out, trouble-free screening performance.



Simple, Powerful Vibrating Mechanism

Only two heavy duty S.K.F. spherical roller self-aligning bearings—running in oil—ingenious internal flingers completely exclude dirt and moisture and positively prevent any loss of lubricant.

Screen Cloth Automatically Held Under Uniform Tension

Compression springs mounted on the clamping plate bolts maintain the proper tension on the screen cloth wires. No whipping with resultant breakage. No baggy screen panels.

Any One Screening Surface Changed Without Disturbing Remaining Decks

Hand-hole plates in the side of screen frame permit operator to remove any one screening surface and replace the screen section independently of other surfaces.

Cushioned Vibration

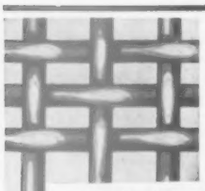
Vibrating frame floats on resilient mountings which absorb all vibrations. No special reinforced substructure required.

This is only part of the story—only four of the twelve important features of the new Deister Plat-O Vibrating Screen—write for all the facts.

DEISTER MACHINE CO.

1933 E. Wayne St. Ft. Wayne, Ind.

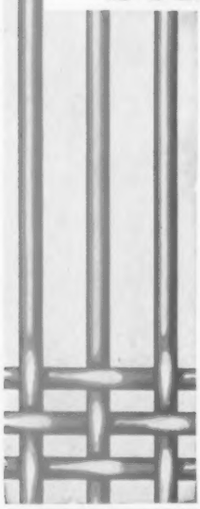
Canadian Licensee and Manufacturer:
Manitoba Bridge & Iron Works, Ltd., Winnipeg



NO. 9381
TY-ROD

U. S. PATENT
NO. 2,024,806
TRADE-MARK REG.

TY-ROD
HIGH CAPACITY
SCREEN



for
DAMP
STICKY and
FIBROUS
materials

TYLER
WOVEN WIRE
SCREEN CLOTH
in All Meshes
and All Metals

TYLER-NIAGARA
SCREENS

HUM-MER and
TYPE 400 SCREENS

SCRUBBING and
DRYING
MACHINERY

THE W. S. TYLER
COMPANY
Cleveland, Ohio

NAYLOR LOCKSEAM SPIRALWELD **PIPE**

Another
HOLE IN THE GROUND
Proves **NAYLOR PIPE**
ECONOMY!

Naylor Pipe in Compressor Room, Chicago Subway

Why use heavy pipe on high pressure air or water lines? Naylor's exclusive structure gives you light weight pipe that is leak-tight, safe, flexible — built to cut costs on toughest jobs. Sizes from 4" to 30" in diameter. All types fittings, connections, and complete fabrication service.

WRITE FOR CATALOG NO. 37

NAYLOR PIPE COMPANY
1257 EAST NINETY-SECOND ST.
CHICAGO, ILLINOIS

This 72-ton dump truck is mounted on 14 pneumatic tires.

ment can move ahead continuously, leaving a smooth, accurate grade, and rolling the dirt off to one side in a windrow. The blade can also be tilted to either side for cutting down banks, ditching, etc.

Speeding up the machine's output was the aim behind the design of the bulldozer. Compact, clean arrangement gives the operator clear vision. The hydraulic control-valve is placed conveniently, permitting positive and almost instantaneous adjustment of the blade while the tractor is in motion. Like the bull-grader, the completely-balanced bulldozer prevents the tractor from "bowing down."

• Dump Truck

The Trojan dump truck, a product of the Trojan Truck Mfg. Co., Los Angeles, Cal., has a capacity of 42 cu. yd. and is believed to be the largest single unit truck in the world. It weighs empty 36 tons, and carries 72 tons. It is powered with an 8-cyl. V-type Diesel engine, which develops approximately 190 hp. at 1150 r.p.m. Its two transmissions were developed especially to handle the 1000 ft. lb. torque of the motor. The first transmission is of the unit power type, with three speeds forward and a reverse. The second, or auxiliary, transmission contains an overdrive, an underdrive, and a direct gear. The overdrive ratio provides an increase in speed of 40 per cent. over that of the direct ratio, and a maximum speed of 25 m.p.h. empty, and 15 m.p.h. loaded. The underdrive ratio provides ample power for any emergency.

The truck has three axles, and the four rear wheels each equipped with three tires are chain driven. In all, fourteen demountable disc wheels and excavator type tires are used.

Power steering is accomplished by a hydraulic ram in the steering mechanism, power for which is supplied by the motor.

The unloader is operated, not by raising the body, but by forcing the load out through the tail gate with a traveling bulkhead, power for which is taken from the motor.

The average hourly fuel consumption is 3½ gal. of 5½-c. Diesel fuel. On average length hauls under average conditions between 90 and 100 cu. yd. of material can be handled per hour.

• Shovel

Traction on the ½-cu.yd. mobile truck-shovel shown in the accompanying illustration has been increased by the addition of a dual tandem-drive system. Produced by the Michigan Power Shovel Co. of Benton Harbor, Mich., it is built for quick conversion from shovel to crane, drag-line, clam or trench hoe.

Chassis stability has received special attention, resulting in a design with unusually low center of gravity. High-tensile alloy steel is used for chassis. Westinghouse air brakes and 9-in. by 20-in. tires are standard on all wheels. Turntable hook rollers and all drum shafts are mounted on ball bearings. Power is gasoline, or Diesel, at option.

Featured by the manufacturers are the finger-tip air clutches and the fast, full-circle swing of shovel. Full vision, roomy cab pro-

Dual-drive system increases traction on this truck-mounted shovel.

motes operator efficiency. The speed and maneuverability of a truck make it practical to move the unit to widely scattered locations.

Bulletin P-205 is available from the manufacturer.

• Improved Screen

A new and exclusive feature of Leahy heavy-duty No-Blind Vibrating screens is the Tri-Vibe panel. Where formerly the free-swinging screen jacket was powered from the vibrator by one vibrating beam, the new Tri-Vibe panel triple powers every square inch of screen jacket with the direct energy of dynamic Leahy differential vibration.

The Tri-Vibe panel is made up of three vibrating beams, suitably tied together by coupler bars along the sides. Thus the positive vibration set up by the Leahy vibrator is regenerated in the screen jacket by triple delivery under controlled transmission and distribution. Full surface vibration is readily assured by the new construction, which also permits an easier adjustment of screen jacket tensioning, a more positive vibration over the full screen jacket, and increased life of screen cloth.

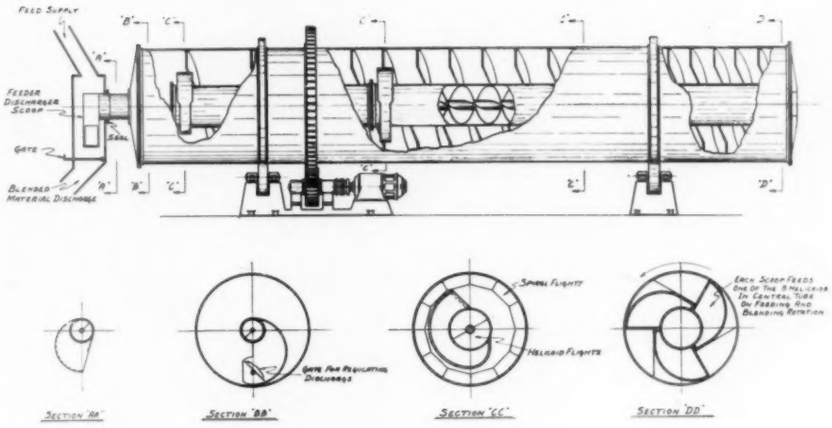
• Dry Blender

The Patterson Triplex dry-blender, employing a new principle of mixing and blending of dry materials to insure complete uniformity, is announced by the Patterson Foundry & Machine Co., East Liverpool, O.

The basic principle of operation is the division of the material into thirds by geometric progression, in addition to which the material undergoes the conventional mixing process during its travel, due to rotation of the cylinders.

The material fed to the blender at the left enters a single helicoid screw flight fastened to the outer shell, traveling one-third the length of the blender, where it enters a double helicoid screw flight, thus being divided into two distinct streams. When the third compartment is reached, the material enters a triple helicoid screw flight and division into three distinct streams is accomplished.

This shop view shows final assembly of a big triple-deck low-head vibrating screen being built at the Allis-Chalmers (Milwaukee) works for a crushed-stone plant in the East. The screening surfaces will be installed over the three sets of longitudinal bars shown. The massive mechanism in the upper foreground gives the screen its characteristic vibrating motion. Approximate weight of this unit is 8,000 lb.



Sketch and cross-sections of the new dry blender.

Each of the three compartments of the outer cylinder is equipped with individual scoop, which picks up one-third of the material and deposits it in the inner cylinder. Again it is divided into sections traveling left toward the starting point the length of one compartment, or one-third the length of the blender, where one stream is permitted to return to the outer cylinder and a double stream carried through the second compartment. Another stream is dropped at the end of the second compartment and the third near the feed end of the machine.

The result is mechanical division in thirds, and because of geometric progression the mixing proceeds rapidly, 4 cycles causing 81 divisions or practically complete mixing. One cycle averages approximately 15 revolutions.

Discharge may be accomplished, by reversing the direction of rotation, through the feed opening, or may be arranged at the opposite end.

Power consumption is very low, and thorough blending is accomplished without generation of internal heat, crushing of particles or dead spots.

• Diesel Drive

An unusual and efficient combination of Diesel power plant, electric generator and electric motors is being used by the Iowa Manufacturing Co. of Cedar Rapids, Ia., to drive

CIRCLE THROW
NEW HOLLAND
NEW EFFICIENCY

A "BULL'S-EYE" NEW HOLLAND *Vibrating* SCREENS

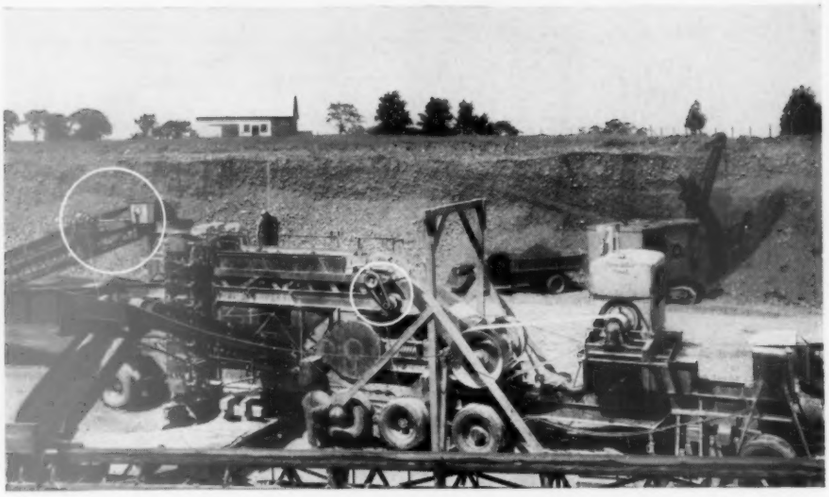
The NEW "circle throw" principle registers a direct hit on the production costs of sand, gravel and aggregates. More uniform grading of material and increased tonnage—lower maintenance and longer service life. Full line of sizes.

A Roll Crusher with a Bigger Appetite

This New Holland Crusher is a glutton for punishment that thrives on a hard rock diet. Patented pulsating feeder doubles capacity. Reduction from 3" down. Built in all capacities up to 100 tons of crushed rock per hour.

Write for Bulletins

NEW HOLLAND MACHINE CO., New Holland, Pa.



Diesel engine at right. Encircled are the electric-motor drives on conveyor and screens.

crushers, screens and conveyors on a Cedar Rapids portable super-tandem crushing plant.

This plant, consists of a 1036 primary crusher, 3018 or 4020 roll crusher, double-deck Symons screen, sand eliminator, and electric generator. The primary crusher is direct driven from a "Caterpillar" Diesel engine mounted on a turn table on the primary truck unit. The electric generator mounted underneath the Diesel engine is driven from the flywheel of the primary crusher opposite the Diesel drive. The generator furnishes power to electric motors driving the screen and conveyors. Power for the roll crusher is taken from the main shaft of the primary crusher.

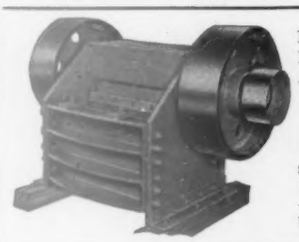
LOW COST CRUSHING FOR 53 YEARS

ROAD BUILDING EQUIPMENT

No Tipping on Slopes

Portable Hammer Crushers
(Ideal for Farm to Market Roads.)

Manufacturers of:
Stationary & Portable Rock and Gravel Crushing and Screening Plants—Single and Double Roll Crushers—Revolving and Vibrating Screens—Conveyors.



Roller Bearing All-Steel

Jaw Crushers

Saves 10% to 15% in Fuel — 90% in Lubrication.

Write for Bulletin "ROADS."

GRUENDLER
CRUSHERS · PULVERIZERS · GRINDERS

GRUENDLER CRUSHER & PULVERIZER CO
2914 N. Market St. St. Louis, Mo.

NEW BULLETIN

Publication of a bulletin on "Current Developments in Rock, Rock Products and Industrial Minerals" has been announced by the Illinois State Geological Survey at Urbana, Ill. Designated as Circular 23-D, the bulletin embraces the following papers:

"Production and Possibilities for Limestone Rubble and Ashlar for Construction," by W. R. Sanborn; "Current Researches on Illinois Stone and Their Relation to Developments in the Stone Industry," by J. E. Lamar; "Properties of Illinois Soils which are Related to Their Need for Limestone and Factors Controlling the Effectiveness of Limestone," by E. E. DeTurk; "Current Developments in Stabilized Gravel and Crushed Stone Roads," by Ernst Lieberman; "Unexploited or Little Known Industrial Minerals of Illinois," by J. E. Lamar, and "Magnetic Separators and Their Possible Applications to the Beneficiation of Illinois Industrial Minerals," by J. J. Ferris.

Another circular, designated 23-C, covers development in "Clay, Clay Products and Industrial Minerals." Papers included are:

"Comparative Status of Clay Mineralogy in Europe and the United States," by R. E. Grim; "Progress, Possibilities and Limitations in the Beneficiation of Clays," by G. A. Bole; "New Developments in the Processing and Forming of Clay Products," by R. K. Hursh; "Unexploited or Little Known Industrial Minerals of Illinois," by J. E. Lamar, and "Magnetic Separators and Their Possible Application to the Beneficiation of Illinois Industrial Minerals," by J. J. Ferris.

INCORPORATIONS

NORTHEAST MATERIALS, INC., Jefferson, O. Capital, $30,000 pfd., 200 shares n.p.v. common. Incorporators: Roy S. Troyer, Frank Felch and L. C. Bull.

PIKE STONE & GRAVEL CORP., Winslow, Ind. Capital, 1,000 shares n.p.v. Incorporators: Harcourt Scales, Eloise Killian and Cleo Scales.

TRIANGLE SAND & GRAVEL CO., Wallace, Ida. William and Bromo Zanetti.

FLORIDA PHOSPHATE & MINING CORP., Ocala, Fla. I. M. Bates, H. C. Dozier and others.

ROCK PRODUCTS CO., Jacksonville, Fla. H. C. Sedding, 1161 Owen Ave., and E. B. Eubanks.

TWELVEPOLE SAND CO., Huntington, W. Va. Incorporators: W. M. Martin and H. W. Harrison.

INDEPENDENCE SAND & GRAVEL CO., Independence, Ore. Capital: $50,000. Incorporators: J. R. McKy and H. B. Ruth.

TOSO AND SCOFIELD SAND & GRAVEL CO., Los Gatos, Cal. Incorporators: Angelo Toso and Ray Scofield.

ALAMANCE STONE CO., Burlington, N. C. Incorporators: Collier Cobb, Jr., Roy M. Homewood and William DeR. Scott.

GLACIER SAND & STONE CO., Norwood, Mass. Capital: $50,000. Incorporators: Edward O'Toole, Mary O'Toole and Leo T. Shine.

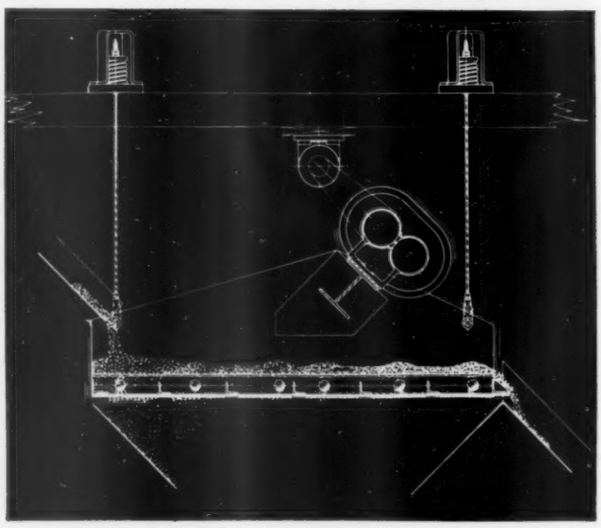
DELHI FOUNDRY SAND CO., Cincinnati, O. Capital: $35,000. Incorporators: Harry F. McVay and James R. Ginn.

RIVERSIDE LIME & STONE CO., 33 N. LaSalle St., Chicago. Capital: 100 shares, n.p.v. Incorporators: J. C. Chaffe, J. Chavkin and F. Schmit.

DUNKLEE SAND & CONCRETE PRODUCTS CO., Greenfield, Mass. Capital: 300 shares n.p.v. Incorporators: Byron J. Whitcomb, William A. Davenport and Nellie Nye.

LAKE SHORE SAND & GRAVEL CO., Kenosha, Wis. Capital: 250 shares, n.p.v. Incorporators: W. Ashmus, J. P. Kraak and D. Tirabassi.

The Allis-Chalmers Mfg. Co., Milwaukee, Wis., has added a new type of low-head vibrating screen especially designed to keep the fine-mesh cloth clean. Below the screen cloth of this Sta-Kleen screen is a sub-deck made of perforated metal. The space between this deck and the screen cloth is divided into compartments each containing a rubber ball. When the screen is in motion the rapid bouncing of these balls sets up a secondary vibration in the screen cloth. Blinding is thus reduced.



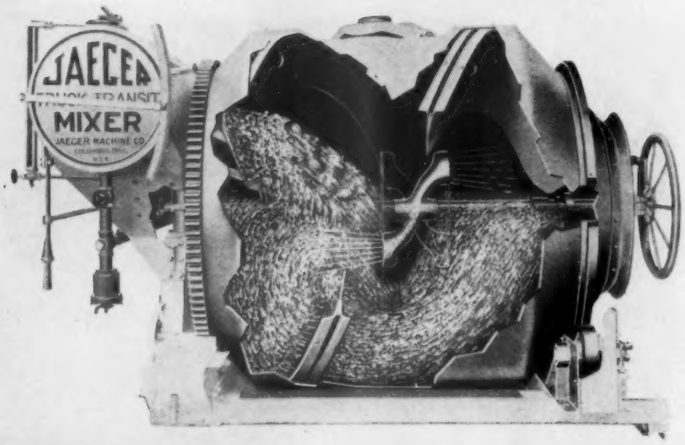
PIT AND QUARRY Special Section

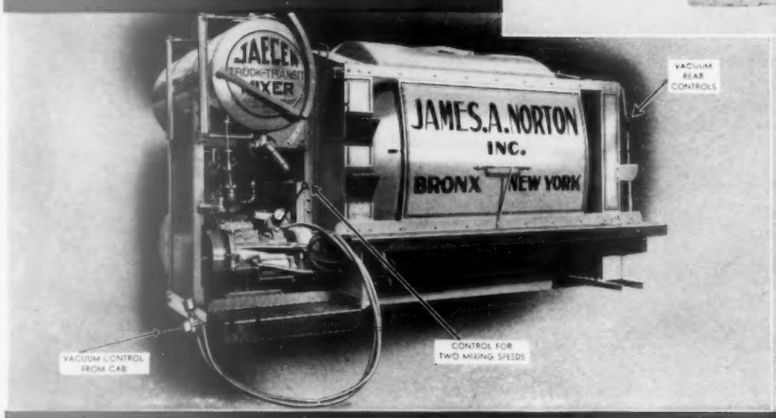
PROFITABLE NEW PRODUCTS

Sand and gravel, produced on the site, are bituminized at this plant of R. E. Hazzard & Sons, San Diego, Cal. The materials are brought in by the scrapers drawn by tractors as seen in the foreground.

VACUUM CONTROLS —DUAL REVOLVING WATER SPRAYS— SYPHO-METER WATER TANK—

Be Sure Your New Mixers Have Them!





JAEGER VACUUM CONTROLS OPERATE FROM CAB

The touch of a foot against the lever starts or stops drum. No effort, no leaning out of cab and no distraction from driving! Safe, Simple, Convenient!

JAEGER, Alone, Builds This

ECONOMICAL TRUCK ENGINE DRIVE WITH VACUUM CAB CONTROLS:

New model truck engines have ample power to operate Jaeger Truck Mixers thru simple power take-off—with mixer ***vacuum controlled from cab by foot lever!*** Simple, easy, safe in traffic—a Jaeger 1939 improvement.

We also furnish Jaeger Truck Mixers with separate engine drive which can be mounted on any truck, old or new.

ACCURATE WATER CONTROL UNDER ALL CONDITIONS - - Plus 100% Faster Distribution

Jaeger Sypho-Meter Water Tank with "Accuracy Chamber" insures accuracy of measurement no matter how long the haul, how rough the road, or how violently water splashes in the tank. Jaeger Dual Revolving Sprays clear path in material as they revolve, spray over and into mass in both directions, from end to end of drum, insure new speed and uniformity of water distribution. Demand these 1939 improvements.

REVERSING END-TO-END "RE"-MIX PRODUCES QUALITY CONCRETE:

No other truck mixer offers this speed and uniformity of water distribution combined with Jaeger's exclusive combination of Dual Mixing Speeds, Double Drum Cones, Continuous Spiral Mixing Blades and Throw-Back Reversing Blades—for mixing higher strength concrete—for discharging it in one fast, clean, continuous pour, without segregation. Jaeger Truck-Mixed Concrete is recognized higher strength, preferred by architects and engineers.

FLASH! NEW YORK ORDERS $225,000 WORTH OF JAEGERS IN PAST 60 DAYS:

These Big Operators Are Standardizing on Jaeger Truck Engine Drive Units with Vacuum Cab Controls

1 — 1½ — 2 — 3 — 4 — 5 — 6 CUBIC YARD SIZES

Modern Truck Mixer

As building activity increases, the sale of ready-mixed concrete is rapidly replacing bulk materials as a profitable business.

In this expansion, Jaeger more than ever takes the lead—with basic improvements in water measurement and distribution and Vacuum Cab Controls—features found in no other truck mixer—features originated by Jaeger just as Jaeger originated the modern, 3-point mounted, Double-End Cone, Self-Cleaning Drum with Throw-Back Reversing Blades, that produces higher strength concrete, mixed end-to-end and discharged in mass.

Today, alert business men who have seen the opportunity and studied the methods of successful operators, are buying Jaeger Truck Mixers. THERE ARE MORE JAEGER TRUCK MIXERS AND AGITATORS IN USE TODAY THAN ALL OTHER MAKES COMBINED.

THE JAEGER MACHINE CO., Columbus, Ohio

SEND FOR YOUR COPY—
NEW 68-PAGE DATA BOOK
FOR READY-MIXED PLANTS
JUST OFF THE PRESS!

Whether you are already operating a ready-mixed plant or planning to start one, you will find this book an invaluable guide and reference on modern truck mixer and agitator operation, compiled by the world's largest manufacturer—up-to-date, authoritative, complete.

THE JAEGER MACHINE COMPANY
602 Dublin Avenue, Columbus, Ohio

Gentlemen:

We are interested in 1939 data on Ready Mixed Plants with Truck Mixers and Agitators, including set-up, operation, maintenance costs, selling of strength concrete, etc., as well as new developments in mixer design.

Name _____

Address _____

PROFITABLE NEW PRODUCTS

Pioneer Pennsylvania Quarry Making Ready-Mixed Concrete

A view of the plant with cement elevator and bin at left, aggregate elevator at right.

ONE of the oldest and largest crushed-stone producers in the east, the John T. Dyer Quarry Co., Birdsboro, Pa., in April, 1938 put in operation its first ready-mixed-concrete plant at Pottstown, Pa. This plant is so designed that it can be used with equal efficiency for dry batching. It was completed just in time to batch 19,000 tons of trap rock and 11,000 tons of sand for the widening to three lanes of a 4-mi. stretch of U. S. Highway No. 422 east of Pottstown. Several hundred cubic yards of concrete was supplied for bridges on this project.

The plant is now used mainly to supply concrete for houses, buildings, sewers, sidewalks, etc. Most of the output is used in Pottstown, which has a population of about 21,000. The product is sold as Birdsboro Trap Rock concrete.

Two 3-cu.yd. Blaw-Knox mixers mounted on Ford V-8 trucks and two 2½-cu.yd. Rex mixers mounted on International trucks are used for mixing and delivering the concrete, but business has been so good that additional mixers may soon be added. As many as six additional truck-mixers have been rented from operators in other cities at times when the demand was heavy. As much as 390 cu.yd. of concrete has been produced in a 10-hr. day. Deliveries have been made as far as 10 mi., but the average haul is about 3 mi. The plant was supplied by the Blaw-Knox Co. and consists of separate plants set side by side for batching aggregates and cement.

Aggregates are received by railway for most jobs; otherwise the hauling is done by trucks. The cars discharge into one hopper and the trucks into another. Both hoppers discharge on the same tunnel belt-conveyor which feeds a steel-inclosed chain bucket-elevator. A revolving chute distributes the aggregates into any of the four compartments of the 300-ton Blaw-Knox steel aggregate-storage bin.

Cement is received in bulk in special bulk-cement cars and is discharged into an inclined screw-conveyor. A steel-inclosed bucket-elevator feeds the cement through a movable spout into either of the two 150-bbl. compartments of the Blaw-Knox steel bin. The aggregate and cement spouts are both controlled by cables from the ground.

The rotary valves through which cement is fed into batcher below.

Aggregates are discharged by means of four clam-shell gates into the 2-compartment weighing batcher, which is equipped with a 4-beam scale and a tell-tale dial and has a capacity of 2½ cu.yd.

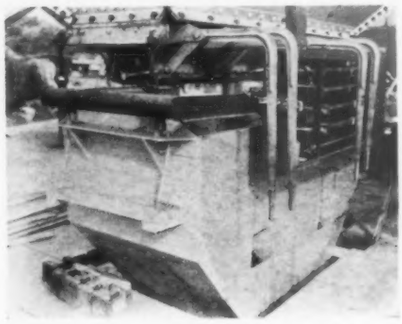
One of the truck-mixers in position beneath the cement-weighing batcher.

The batched aggregates are discharged into a stationary hopper with a rubber sleeve which goes into the charging opening of the mixer. The truck is first loaded with aggregates and is then run into position under the cement batcher.

Cement is discharged through two rotary valves into a 1-compartment batcher with a capacity of 2,000 lb. This batcher has a 2-beam Winslow scale and a tell-tale dial. Cement is

discharged from the batcher through a rotary gate into a canvas hopper and spout, which is counterweighted and can be moved up and down to load the truck-mixers. Water is obtained from the city mains and the driver measures the required amount from the truck-mixer tank.

The Monocacy Quarry, one of three operated by the John T. Dyer Quarry Co., is located about 8 mi. west of



The aggregate-weighing batcher with bin gates and scale.

Pottstown. This quarry supplies trap rock and stone sand for the concrete plant. Stone sand is used in about 80 per cent. of the concrete produced.

E. J. Breneman is superintendent of the plant and also acts as sales manager for its product. Most of the selling is done by direct contacts, but advertising in local newspapers has also proved effective in getting certain types of business. Users of concrete have had to be sold on the advantages of ready-mixed concrete and of ordering it on a strength basis. Most of the concrete produced is now sold on a strength basis.

Installs Compact Plant for Loading Trucks

Compactness and economy are the keynote of the new composite truck-mixer loading plant furnished by the Blaw-Knox Co., Pittsburgh, Pa., to the W. D. Haden Co. at Houston, Tex. The design represents both a novel combination of equipment and original application to meet local conditions.

The circular storage bin is 22 ft. in diameter and contains seven separate compartments. Three of these are for cement, with two of 125-bbl. and the third of 250-bbl. capacity. Each of the four aggregate compartments holds 56 tons.

Aggregates are loaded into the bin by means of a crawler crane with a clamshell bucket. Bulk cement is received in box-cars and unloaded by screw-feeder to the vertical bucket-elevator shown in the illustration. Cement is distributed to the three compartments of the cement section by flop gates and a chute.

New mixer-loading plant of the W. D. Haden Co., Houston, Tex.

The driveway for Trukmixers and batch trucks is depressed into a tunnel beneath the plant in order to accommodate the overall height to the reach of the crawler crane. The aggregate weighing batcher is of 2-cu. yd. size and equipped with a springless dial scale. The cement batcher is the same size but equipped with a beam scale. Both batchers are manually operated, and the batcher operator is able to weigh out and load a complete 2-cu. yd. batch of cement and aggregates into one of the Blaw-Knox Trukmixers in less than one minute.

House Movement Caused by Ground Vibrations

Valuable information as to the effects produced by ground movements resulting from the firing of blasts upon buildings in the vicinity of quarries is being obtained by the Bureau of Mines, U. S. Department of the Interior, in the course of tests conducted at the new testing adit operated at Mt. Weather, Va. The Bureau of Mines, for several years, has been studying the characteristics of the seismic wave set up in the ground by quarry blasts and other sources of vibration. Recently, experiments have been made on a residential structure to observe the effect of the seismic wave on the building. The testing adit is almost directly under a building used as an office. Blasts were made in the adit and the movement of the building recorded by seismometers. The intensity of the blasts was increased until the plaster in the building was cracked.

It was found that a movement of nearly 0.10 in. was required to crack old brittle plaster and a movement of between 0.20 and 0.30 in. was necessary to crack new but well seasoned plaster. In all cases, plaster failure was caused by differential or relative movement between parts of the structure rather than from strictly panel vibration of wall or floor.

Numerous tests made in houses in the field in which movement was caused by quarry blasts were tabulated and, when compared with the tests at Mt. Weather, it was found that the largest amplitudes recorded in the field were only ⅓ to ⅛ that found necessary to cause damage in the Mt. Weather tests. The average of 13 field tests was only 5 per cent. of the damaging amplitude at Mt. Weather.

"SPEC" COLLINS

Outlines . . . .

14 POINTS FOR SALES SUCCESS

"WELL the first half looks pretty good," said a friend of mine who has been in the building-material business for over 20 years, when queried about the prospects for 1939. "But I'll tell you," he continued, "we've got to keep it coming, if we're going to have a good second half. The need for more construction is here, the urge to build is here, the money is available, but the type of work that will be done and the amount of it depends largely on *how*—and *how well*—the job of selling is done. It looks like a good year ahead for some folks—the folks who do an intelligent selling job."

And this man knows whereof he speaks. Over the past 12 years his business has steadily expanded in spite of "depression" and "recession." When I first knew him he was exclusively a sand-and-gravel producer. Then he added a line of concrete products. A little later, sensing the opportunities in the ready-mixed-concrete business, he entered that field also. "I figured I might as well make more than one profit on my sand and gravel," he told me. And the progress he has made since 1927 would seem to justify his thinking. I've always been interested in his progress because of his clean-cut, hard-hitting selling tactics. They have always kept him far ahead of his competitors in all three of his lines, sand and gravel, concrete products and ready-mixed concrete.

The following 14 points are taken, with his permission, from a letter which he wrote all his salesmen the first of this year. They are given here, hoping that they will help you, too, make the second half of 1939 as good as the first half.

1. *Plan Your Work.*—Take time every morning before you leave the office to plan your work for the day—where you're going to go, how you're going to get there, whom you're going to see, what you're going to talk about after you see your man. Make a plan that will enable you to have something specific, something worth-while, for every man you're going to talk to. Plan to be positive and optimistic. Have something worth while to say or don't make the call.

2. *Work Your Plan.*—Follow through on that plan. If interruptions and unexpected things disturb it, go back to it as quickly as you possibly can. Don't stray too far away from what you planned to talk about. Let the other fellow do most of the talking about politics and the state of the nation. What you're interested in is the order.

It's easy to get testimonial letters about products as well made as those of the Cunard-Lang Concrete Co. of Columbus, O.

Only quality products and aggressive merchandising will build a plant and business as fine as that of the Standard Concrete Products Co., York, Pa.

3. *Talk Profit, Not Price.*—The best defense is a good offense. Everyone talks price, but too few think to translate price into terms of profit. After all what you're selling your customers is not so many yards of gravel, so many yards of concrete, so many blocks. You're selling them a product and a service that will help them make a profit. You'll always find them interested in profit. When the customer starts to talk price make a counter-attack with a profit story. Always remember to think in terms of profit and talk in terms of profit on every job, large or small.

4. *Develop New Sales Arguments.*—Whenever you get the opportunity, spend some time with salesmen selling other lines—groceries, drugs, dry goods. Find out what sort of selling arguments they use to get business. You'll probably be able to pick up many ideas that you can use in this business of ours. Keep your approach fresh and up-to-the-minute. Don't forget to play up any improvement in our product or our

service. A new method of washing, a new block machine that gives a smoother top to the block, a new light delivery truck that will get in closer to the job—all are news to our customers, all might be turned into new sales arguments for our products.

5. *Check Your Territories for New Customers.*—Don't depend too much on building permits for your prospect lists. Keep your eyes open for existing buildings that might need new driveways, new foundations, new additions. Stop in to see if they might need new floors. Get acquainted with the maintenance men in the factories in your territories. Remember that jobs of this kind are often sold without competition. The remodeling and repair market is a good one and is always with us. Keep your eyes and ears open for future developments.

6. *Always Talk the Language of Your Customers.*—Keep in mind that your customer is interested in *his* business, not yours. Talk to him about it.

"Go over your sales territory with a fine-tooth comb."

Gain his confidence by your intimate knowledge of his problems. Translate your sales story into the terms of his business. He'll get it quicker and his response will be better. He isn't interested in chewing gum or corsets; he *is* interested in construction.

7. *Be Able to Offer Constructive Help.*—When your customer starts to cry about how tough business is or how tight he had to figure to get his job, be in a position to give him a couple of suggestions that will help him to make a profit. Even though your suggestion doesn't always click, your customer will know that you are trying to help him, that you're interested in his making a profit as well as in selling him materials. Read every trade paper and magazine connected with this business. In their pages you'll find dozens of suggestions that you can pass on to your customers. You'll find that one suggestion of this sort that has helped the customer make a profit will gain you a more lasting friendship that a dozen "shaded" prices. Your customer doesn't want to shade a price any more than you do, but he's always interested in *saving* money on every job. The magazines are available to you; use them.

"Use hard-hitting selling tactics."

"Back up your sales story with facts and figures."

8. *Use Testimonials.*—When you sell a job on which the customer is unusually well pleased with our product and our service get a testimonial letter from him. You'll find your customers always interested in what the other fellow has to say. And it leaves the way wide open for you to tell, in terms of the other fellow, why your materials and service enabled you to get the letter. The testimonial advertising for products of every kind seems to be sure-fire, judging from the amount of it in the magazines. We can use this same sales tool to sell our products and services just as well as the national advertisers.

9. *Be Fair in Your Comparisons.*—Often you can sell a job by comparisons when nothing else will turn the trick. But make them fair. Tell the whole story. Stick to facts. When you're making comparisons, emphasize our strong points rather than the weak points of our competitors. Be a good sport, give the other fellow his just dues. Sell the job on the strength of *our* superiority.

10. *Back Up Your Sales Story With Facts and Figures.*—It's really surprising how many salesmen fail to tell a straight story. They guess at sizes, at weights, at quantities needed. Learn to be specific. Know your products, what they will do, how much of them will be needed, just when you can deliver. You'll make customers and keep friends, if they can depend on you for accurate estimates instead of guesswork. Always remember that *you* are a concrete specialist. And use the knowledge that has made you that specialist to make sales.

11. *Be a Factor In Your Community.*—Become interested in the affairs of your community. You'll find that an investment of your off time in charitable or civic affairs not only a lot of fun but an investment in friends and customers. Once you get into this sort of thing you'll be surprised how many leads you'll get from your new contacts. And you'll find the people you do business with always more willing to talk to you once you become a leader in community affairs.

12. *Analyze Every Job You Lose.*—Analyze the sales that you lose as well as the sales that you make to see why you did not "click" on the order you lost. Maybe you didn't "ask" for the order; maybe you didn't emphasize some important sales point; maybe we could have rendered some special service that would have put the job across; maybe you jumped at the conclusion that the job was tied up with someone else; maybe you talked price instead of profit. A self-analysis of this sort is going to be helpful to you on the next job and may be the means of preventing you from losing it too.

"Don't talk price—talk profits."

13. *Spend Plenty of Time With Your Best Accounts.*—Don't take your good accounts for granted and spend too little time with them once you have them coming your way. I don't mean that you are to spend *all* your time with these acounts, but enough to give the sort of service and attention that they deserve and that this company has built its reputation and business on. Remember, these "best" accounts are important

(Continued on page 73)

LEFT—The power press stripper which produces all the units at the Lake Shore Cement Products Co. plant. Concrete elevator at left, cast-iron pallets at the right.

New Concrete-Block Producer Finds Quality Product Sells

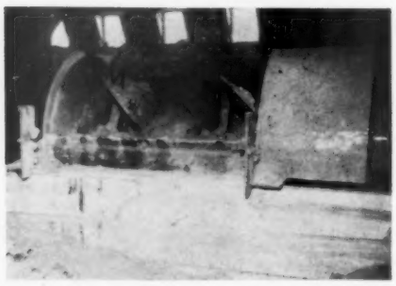
LAST year a personal survey by E. N. Leigh of Chesterton, Ind., disclosed that while considerable building was in progress and in prospect in the industrial and resort communities in and around Michigan City, Ind., many of the concrete blocks used were being shipped in. Engaging Mitchell Loniewski, an experienced block manufacturer, as his assistant, Mr. Leigh formed the Lake Shore Cement Products Co. and established his plant in an existing building just west of Michigan City. Production began in October, and builders were so well pleased with the quality of the product being turned out that the plant has operated through the winter supplying the demand.

Both gravel and Waylite units are being manufactured. Sand and gravel are obtained from the shore of Lake Michigan, scarcely a mile distant, and are hauled to the plant by truck. The lightweight aggregate—Waylite—comes from the blast furnaces of the steel mills in the Calumet area about 30 mi. to the west.

The mixer, concrete elevator, and block machine were obtained from the Multiplex Concrete Machinery Co. Wheelbarrows are used to load the Multi-Mixer, while the units are produced on a Junior Power Press. Multiplex cast-iron pallets are used exclusively and the close core-box fit produces clean, sharp-edged units with complete and rapid curing being assured because of free air movement through the piles. The capacity of the stripper is about 1,000 standard-size units per day.

The concern is also producing a special "bull-nosed" block with rounded corners and a formed slot to allow the efficient and economical use of steel sash in building. The sash fits snugly into these slots, and the round corners allow the maximum amount of daylight to enter, as much as 47 per cent. more than is possible with ordinary construction, according to Mr. Leigh.

At present the units are air-cured for about a week inside the plant building which is adequately heated, but steam-curing rooms are to be installed at an early date.

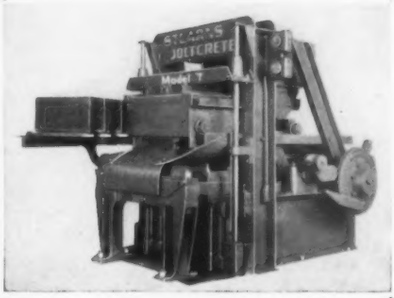


The reverse-screw-type mixer.

Truck which delivers materials.

Business so far has come in with little sales effort, but Mr. Leigh plans an intensive promotional campaign this spring, utilizing local newspaper advertising and direct mail. As a gesture toward community good-will, the concern became affiliated with the Michigan City Chamber of Commerce in February of this year and is actively

The Vibration Machine Supreme



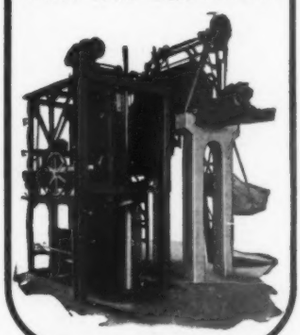
Vibration under pressure — 7,200 blows per minute—and ruggedly built to give long life, the Joltcrete machine is the choice of the wise concrete-products operator. Produces clean-cut, high strength units in any size, and gets the most out of a bag of cement. Built in three sizes with capacities of 7 to 9 standard units per minute.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers, and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager **Columbus, Ohio**

UNIVERSAL

"U" CAN START
A PROFITABLE BUSINESS
WITH THIS EQUIPMENT



CONCRETE • PIPE

EQUIPMENT

This "Universal" Concrete Pipe Machine will get you started in a profitable and growing business. The UNIVERSAL is an "all-purpose" machine for producing all sizes required in the average market. Assures efficient and economical operation—gives the maximum production of quality pipe per man, per day, and per bag of cement.

For results that count UP, "U" is all the equipment you need to start business.

Write for Bulletin

UNIVERSAL Concrete Pipe Co.
Columbus **Ohio**

supporting the chamber in its efforts toward bringing in new factories and in the promotion of its 1939 campaign to build several hundred new residences to relieve the existing shortage of modern, desirable dwellings.

Both Mr. Leigh and Mr. Loniewski attended the concrete conventions in

E. N. Leigh and Mitchell Loniewski.

Chicago early in February and were so impressed with the results obtained by other block manufacturers, who built concrete demonstration houses, that they hope to do likewise in the near future.

Collins *(from page 71)*

to us. Treat every one of them with the degree of importance to which they are entitled; and remember at the same time that part of your job is to develop *new* business.

14. *Be Loyal.*—Finally, be loyal to your company and to your customers. Your company is trying to provide you with the finest materials that it is possible to make. It is trying to give your customers, its customers, a service that is better than that rendered by any other firm in its business. It is doing those things so that you can look every customer in the eye and be proud of every load of its material that you sell. Your company is being loyal to you. Be loyal to it by giving it the best you have.

A decline in the sale of cement in Cuba was recorded during 1938, as compared with 1937, according to a report to the Department of Commerce from the office of the American Commercial Attache at Havana. The 1938 output, however, was far greater than that of 1936.

KENT-ROOT VIBRA-PRESS

VIBRATION

In the mold box where you need it for perfect action.

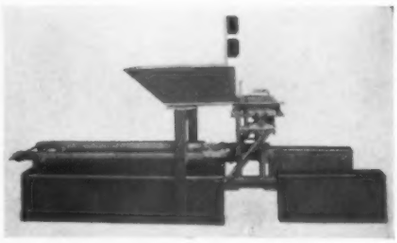
PRESSING

Done in floating mold box for producing perfect units.

Write for information

The Kent Machine Company
Cuyahoga Falls, Ohio

VIBRATION



One man operated Hollostone machine makes one hundred fifty square feet of eight inch wall per hour. Mold changed in five minutes. All sizes on the same inexpensive pallet. Greatest production per dollar invested in machine and labor.

HOLLOSTONE MACHINE CO.
7151 Lankershim Blvd.
North Hollywood **California**

Heltzel
BUILDS IT BETTER

HELTZEL Circular Steel Bins for low cost storage — cuts truck and labor costs — expedites deliveries. Bulletin S-21.

HELTZEL STEEL FORM & IRON CO.
WARREN, OHIO, U.S.A.

NEW *Sewer and Culvert Construction*

By making concrete pipe on the job with Quinn Forms you give more men more work, can use less experienced labor and produce uniform concrete pipe of highest quality. Recognized standard of all concrete pipe.

QUINN PIPE FORMS

Quinn Heavy Duty and Medium Duty Pipe Forms best for hand or wet process pipe. Give more years of service. All diameters—12 to 84 inches. Tongue and groove or bell end pipe, any length.

WRITE for New Book on Concrete Pipe giving information and prices, valuable tables on production costs, strength tests, Pipe Forms, Pipe Machines, etc. Book sent free.

QUINN WIRE & IRON WORKS 1627 12 St. Boone, Iowa

START A NEW BUSINESS

This shows one of our Multiple Molds for casting 8x8x16" concrete blocks. We manufacture a complete line of Multiple Molds for blocks (both Rockface and plain), for brick, veneer blocks, etc. We are also owner and originator of the ZAGELMEYER SYSTEM of granite veneer for blocks.

Make
ZAGELMEYER
Waterproof Concrete Blocks

A Start May Be Made With as Little as $500.00

The Zagelmeyer System produces a block that no other system can equal. Many good territories open. Write today for further information.

Zagelmeyer Cast Stone Block Machinery Co.
502 S. Henry St. BAY CITY, MICH.

ROL-MAN
TRUE MANGANESE STEEL

Screens

Highest abrasion resistance of any known steel. Double Lock Mesh Weave perpetuates initial accuracy for the life of the screen. Send for prices and performance facts.

MANGANESE STEEL FORGE CO., CASTOR AVE. & ALLEN ST., PHILA., PA.

STRAYER PORTABLE CONCRETE PLANT

Plant in Transit

A DOUBLE DUTY PLANT

A Portable and Central Mixing Plant, combined in one unit—Towed by Truck.

Reduces labor cost—No waste—No extra haul—No rehandling of materials—No costly setup and takedown. Load, store, batch materials and mix concrete on job or other location.

Load transit mixers or other trucks. Extends bidding territory. Designed, built, and fully equipped to produce low cost concrete under any specification. Approved by engineers.

Write for Complete Information

Working on High School, Rockford, Ill. Charles B. Johnson & Sons, Chicago, Ill.

ERIE STEEL CONSTRUCTION COMPANY
BOX 1031-P, ERIE, PENNSYLVANIA

CUMMER ASPHALT PLANTS

COMBINATION HOT AND COLD MIX PLANTS

Using the Combination Two Fire Dryer Cooler.

HOT MIX PLANTS

Using the new Cummer Internal Fire Dryer.

DRYERS

Combination Two Fire Dryer Cooler
The New Cummer Internal First Dryer
(1 machine)

STEAM JACKETED ASPHALT BUCKETS

Stationary, bottom discharge type.

VIBRATING SCREENS

Cummer-Robins inclined type for any make or size of asphalt plant.

MIXERS

400 to 5000 pound batch, steam jacketed, with the new mixer teeth adjustable for top or binder without change.

Write for bulletins.

THE F. D. CUMMER & SON CO.
Cleveland Ohio
Builders of fine asphalt paving machinery since 1895

Another Plant Goes MULTIPLEX

The new plant of the Lake Shore Cement Products Co., Michigan City, Ind., is completely MULTIPLEX-equipped. A Multi-Mixer mixes the concrete, a Multiplex Junior Power Press produces the block on Multiplex pallets. Built for service and production, simple in construction and foolproof, the Junior Power Press makes all sizes in plain or faced design with perfectly pressed top and bottom and uniform textures. Investigate this low-priced, high-production machine! Investigate, too, the complete timed-tested line of MULTIPLEX equipment. For the man who wants to make quick profits from a small investment in concrete-block machinery, MULTIPLEX Equipment is a sure thing. Write for Catalog.

The Multiplex CONCRETE MACHINERY CO.
ELMORE, OHIO

MIXES While Charging!

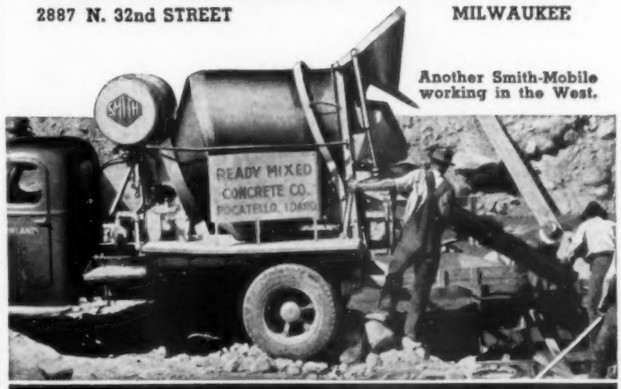
SMITH-MOBILE saves minutes with every batch. Shrinking and mixing starts the instant the batch enters the drum, because *the drum rotates during the charging process* — an exclusive SMITH-MOBILE feature.

The big, roomy feed chute makes it easy to spot the machine under the bin gates. As the materials enter the revolving drum, the scientifically designed blades "pull" the batch away from the drum opening and start working on it immediately. No delay! No troublesome, leaky hatch to open or close.

SMITH-MOBILE'S HIGH DISCHARGE permits a steeper and longer distributing spout. Covers a greater area even with dry concrete. Discharges conveniently into carts, buckets, high forms, etc. No hoist or ramp required.

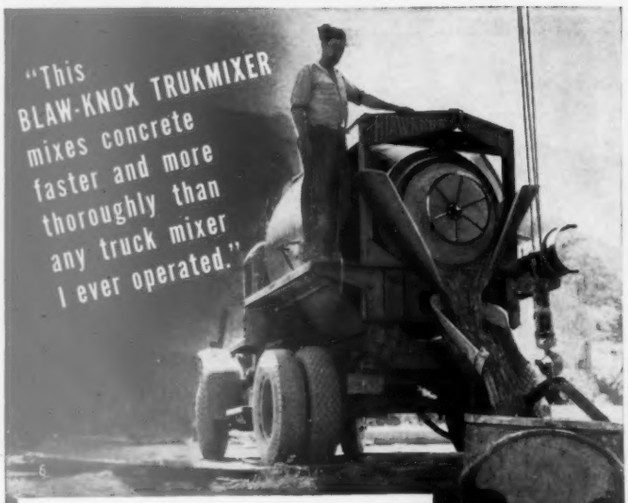
Write for new Smith-Mobile literature.

THE T. L. SMITH COMPANY
2887 N. 32nd STREET MILWAUKEE



Another Smith-Mobile working in the West.

SMITH-MOBILE
THE *Modern* TRUCK MIXER and AGITATOR

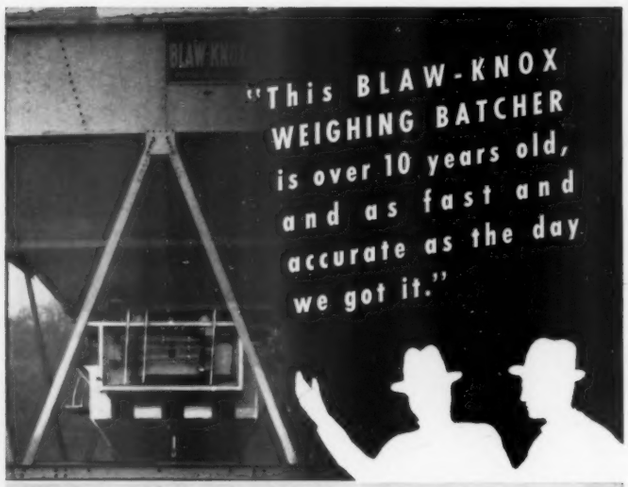


Users look at the details of construction and performance—then buy Blaw-Knox TRUK-MIXERS.

The desirable and popular features of Blaw-Knox Trukmixers and Agitators are completely illustrated and descibed in Catalog No. 1582. Send for your copy.

BLAW-KNOX DIVISION of Blaw-Knox Company
FARMER'S BANK BUILDING PITTSBURGH, PENNA

BLAW-KNOX
TRUKMIXERS *and Agitators*



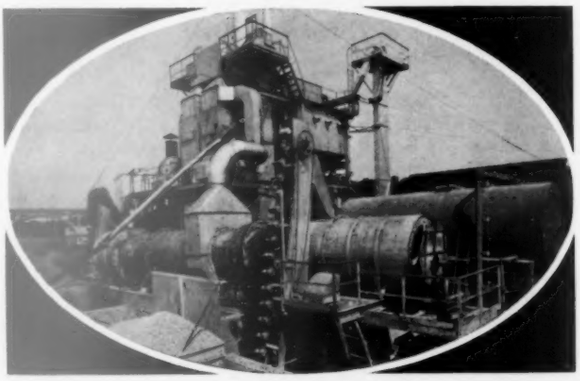
Built for maximum speed and accuracy in measuring AGGREGATES, CEMENT AND WATER, Blaw-Knox Weighing Batchers are standard equipment in widespread use by road contractors, for general construction, material yards, and ready mixed concrete plants. They satisfy all modern specifications. Furnished for manual or automatic operation.

The reliability of Blaw-Knox Weighing Batchers is acknowledged by thousands of users. Send for catalog No. 1566.

18

BLAW-KNOX BLAW-KNOX DIVISION OF BLAW-KNOX CO. Farmers Bank Bldg. Pittsburgh, Pa.
Weighing Batchers

McCARTER
Built this Double Asphalt Mixing Plant
OF COURSE



CORSON & GRUMAN CO., INC., Washington, D. C.
"McCarter" Designed—Fabricated—Erected

This compact, high-production installation features:
Two "McCarter" 2-Ton Pug Mill Mixers.
2 Patented Telescopic Drier-Coolers.
Capacity 150 Tons Sheet Asphalt, or Cold Mix, Per Hour.
No Steam Used Throughout This Plant.
"McCarter" can modernize your present plant to meet present requirements.

Send for Bulletin
Designers and Manufacturers Uninterruptedly since 1827
The McCarter Iron Works, Inc.
NORRISTOWN PENNSYLVANIA

COMMERCIAL'S
New Catalog

"JUST OFF THE PRESS"

WRITE FOR IT

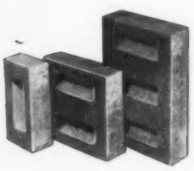
The COMMERCIAL SHEARING & STAMPING COMPANY
YOUNGSTOWN, OHIO.

Proven OPPORTUNITY
3 MILLION DUNBRIK SOLD FIRST YEAR

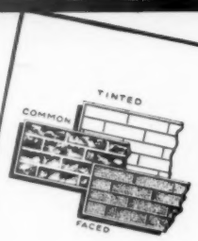
You will realize after reading Mr. Rose's letter what an outstanding local manufacturing business he established in one year in the small city of Goldsboro, N. C. His production costs and selling prices prove the excellent earning power of the DUNBRIK Line-Production Plant.

Mr. Rose's success is but one example. Let us tell you too about the many other successful DUNBRIK Manufacturers in this and foreign countries—

How their business is exclusive, protected by franchise—how the wonderful Line-Production DUNBRIK Machine turns out superior products at lowest cost — Why DUNBRIK-DUNSTONE offers permanent, air-cell insulation and hollow wall construction at the cost level of frame—And how the products can be supplied in a wider range of colors than any other masonry material.



INVESTIGATE NOW. Send for "4 Keys to Success." It tells how Mr. Rose and other manufacturers are making outstanding progress in this new industry that offers such great opportunity for growth, expansion and profit. Get the complete story. Write today.



W. P. ROSE BUILDERS SUPPL
(INCORPORATED)
MANUFACTURERS OF
Dunbrik and Dunstone
GOLDSBORO, N. C.

MR. W. P. ROSE

W. E. Dunn Mfg. Co.,
Holland, Mich.
Gentlemen:

I am pleased to give you the cost of manufacturing Dunbrik stacked on the yard ready for delivery, as follows:

1250#	Fine Sand	
1250#	Coarse "	
1250#	Pea Gravel	
3750#	Net aggregate cost	$1.50
5	Bags Cement @ 60¢	3.00
	Labor per M	1.10
	Power (Electric)	.10
	Plant Overhead	.30
	Total	$6.00

The above estimate is based on 1000 brick. When we use steam for curing it adds to the cost 25¢ per M. This, however, is not necessary, only when the mean temperature is below 70 degrees.

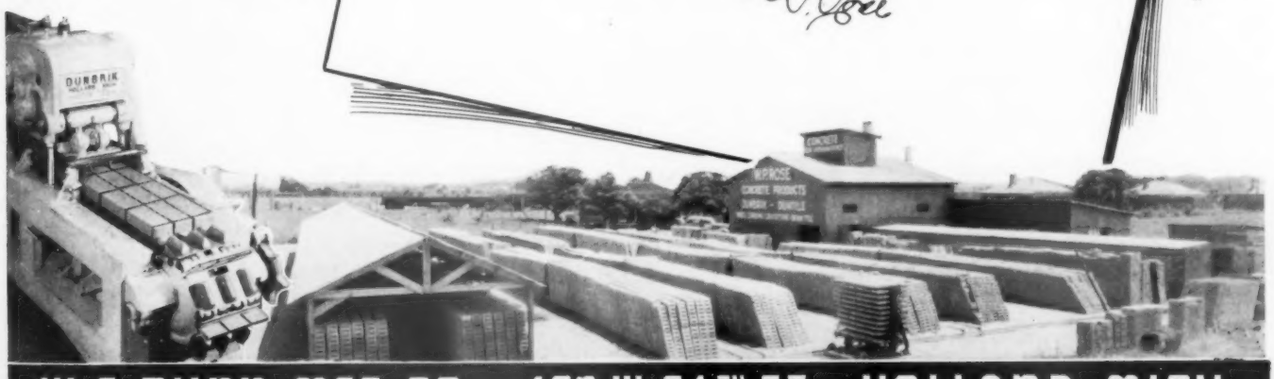
Our sales for the first year amounted to three million brick. Our annual capacity, if the plant is run regularly, will amount to three and one half million brick.

Our Dunbrik retail F.O.B. Plant at $12.50 per M, and our customers are our very best salesmen.

We have here a clay brick plant that can turn out 100 million brick annually and has been in business for twenty-five years. Yet we have found a ready sale for our product and we know of no dissatisfied customers.

Yours very truly,

W. P. Rose



W. E. DUNN MFG. CO. 420 W. 24TH ST., HOLLAND, MICH.

BUYERS' GUIDE

A Directory of Pit and Quarry Advertisers Indexed According to Product.

Although every effort is made to insure accuracy and completeness in these listings, the publisher cannot accept responsibility for errors or omissions. Any mistakes discovered will gladly be rectified.

Index to Advertisers on Page 96

Aggregate-Bituminizing Plants
Cummer & Son Co., The F. D.
Hetherington & Berner, Inc.
McCarter Iron Works, Inc., The
Simplicity System Co.
*Warren Brothers Roads Co.

Aggremeters
*Erie Steel Construction Co.

Agitators, Thickeners and Slurry Mixers
*Smidth & Co., F. L.
*Traylor Engr. & Mfg. Co.

Air Compressors (Stationary)
Fuller Company

Air Filters
*Blaw-Knox Co.
*Buell Engineering Co.
*Parsons Engineering Corp.

Air Separators
*Gruendler Crusher & Pulverizer Co.
*Raymond Pulverizer Division of the Combustion Engineering Co.
*Williams Patent Crusher & Pulverizer Co.

Alloys (Steel)
Alloy Steel & Metals Co.
Chicago Steel Fdry. Co.
Manganese Steel Forge Co.

Ash and Refuse Handling Equipment
*Haiss Mfg. Co., Geo.
Hetherington & Berner, Inc.
*Link-Belt Co.
*Robins Conveying Belt Co.

Asphalt Mixing Plants
Cummer & Son Co., The F. D.
Hetherington & Berner, Inc.
McCarter Iron Works, Inc., The
Simplicity System Co.
*Warren Brothers Roads Co.

Automatic Feeders
*Fuller Company
*Link-Belt Co.
McCarter Iron Works, Inc., The
*Merrick Scale Mfg. Co.

Automatic Weighers
*Blaw-Knox Co.
*Erie Steel Construction Co.
*Fuller Company
*Jaeger Machine Co.
McCarter Iron Works, Inc., The
*Merrick Scale Mfg. Co.

Backfillers
*Bucyrus-Erie Co.
Harnischfeger Corp.

Balls (Grinding)
Manganese Steel Forge Co.
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.

Balls (Tube-Mill, etc.)
Manganese Steel Forge Co.
*Smidth & Co., F. L.
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.

Bearings (Anti-Friction)
Hetherington & Berner, Inc.
*Link-Belt Co.
Robins Conveying Belt Co.
Sprout, Waldron & Co.
Timken Roller Bearing Co.

Bearings (Roller)
Timken Roller Bearing Co.

Belt Fasteners
Bristol Co.
Flexible Steel Lacing Co.

Belt Lacing
Bristol Co.
Flexible Steel Lacing Co.

Belt Rivets
Bristol Co.

Belting
*Haiss Mfg. Co., Geo.
*Link-Belt Co.
Republic Rubber Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Belting (Conveyor and Elevator)
Goodyear Tire & Rubber Co.

Belting (Multiple V)
Gates Rubber Co.
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Belts (Fan)
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Bin Gates
*Erie Steel Construction Co.
*Fuller Company
*Haiss Mfg. Co., Geo.
Heltzel Steel Form & Iron Co.
*Hendrick Mfg. Co.
Industrial Brownhoist Corp.
*Link-Belt Co.
Manganese Steel Forge Co.
McCarter Iron Works, Inc., The
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Bins (Steel)
*Blaw-Knox Co.
*Erie Steel Construction Co.
Heltzel Steel Form & Iron Co.
*Hendrick Mfg. Co.
Hetherington & Berner, Inc.
*Link-Belt Co.
Manganese Steel Forge Co.
McCarter Iron Works, Inc., The
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.
*Universal Crusher Co.

Blast-Hole Drills (See Drills—Blast-Hole)

Blasting Machines
National Powder Co.

Blasting Supplies
*Ensign-Bickford Co.
National Powder Co.

Block Machines (Concrete)
Anchor Concrete Machy. Co.
Dunn Mfg. Co., W. E.
Hollostone Co.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Block Machines (Power Press, Concrete)
Anchor Concrete Machy. Co.
Dunn Mfg. Co., W. E.
Hollostone Co.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Blocks (Sheave)
*Haiss Mfg. Co., Geo.
*Sauerman Bros., Inc.
Sprout, Waldron & Co.

Blowers
*Buell Engineering Co.

Bodies (Motor Truck, Concrete Mixing)
*Blaw-Knox Co.
Hug Co., The
Jaeger Machine Co.
*Smith Co., T. L.

Bodies (Dump Truck)
Commercial Shearing & Stamping Co.

Boots (Rubber)
Goodyear Tire & Rubber Co.

Borings (Core)
Hoffman Bros. Drilling Co.
Pennsylvania Drilling Co.

Brick Machines (Concrete)
Dunn Mfg. Co., W. E.
Hollostone Co.

Brick Manufacturing Equipment
Dunn Mfg. Co., W. E.

Bronze Work (Ornamental)
*National Wire Cloth Co.
*Tyler Co., W. S.

Bucket Elevators (See Conveyors and Elevators)

Buckets (Asphalt)
McCarter Iron Works, Inc., The

Buckets (Clamshell, Orange-Peel, Etc.)
*Blaw-Knox Co.
*Erie Steel Construction Co.
*Haiss Mfg. Co., Geo.
Harnischfeger Corp.
Industrial Brownhoist Corp.
*Link-Belt Co.
Owen Bucket Co.
Wellman Engineering Co.

Buckets (Dragline—Cableway)
*Bucyrus-Erie Co.
*Erie Steel Construction Co.
*Link-Belt Co.
*Sauerman Bros., Inc.
Wellman Engineering Co.

Buckets (Dump)
*Brooks Equip. & Mfg. Co.
*Dempster Bros. Inc.
*Jaeger Machine Co.

Buckets (Elec. Heated, Weighing)
McCarter Iron Works, Inc., The

Buckets (Elevator and Conveyor)
Chicago Steel Fdry. Co.
*Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
Industrial Brownhoist Corp.
*Link-Belt Co.
McLanahan and Stone Corp.
Manganese Steel Forge Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Buggies (Dump)
*Koehring Co.

Bulk-Cement Storage Plants
Heltzel Steel Form & Iron Co.
McCarter Iron Works, Inc., The
Sprout, Waldron & Co.

Cables (Drilling)
Wall Rope Works, Inc.

Cables (Manila)
Wall Rope Works, Inc.

Cableways
*American Steel & Wire Co.
*Roebling's Sons Co., John A.
*Sauerman Bros., inc.

Caps (Blasting)
National Powder Co.

Caps (Blasting, Electric)
National Powder Co.

Capstans (See Winches and Capstans)

Car Dumpers
*Link-Belt Co.
Wellman Engineering Co.

Car Pullers
*Link-Belt Co.

Car Wheels — (See Wheels — Car)

Carriers
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Carryalls
*Koehring Co.

Cars (Block, Concrete)
*Link Belt Co.
*Multiplex Concrete Machinery Co.

Cars (Quarry & Gravel Pit)
Sanford-Day Iron Works

Castings
Alloy Steel & Metals Co.
Chicago Steel Fdry. Co.
*Eagle Iron Works
Hetherington & Berner, Inc.
*Link-Belt Co.
McLanahan & Stone Corp.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Cement Pumps (See Pumps; Air Pumps; Pumps, Cement Slurry; Pumps, Bulk Cement)

Central Concrete Mixing Plants (Comp.)
*Erie Steel Construction Co.
Heltzel Steel Form & Iron Co.
*Jaeger Machine Co.
McCarter Iron Works, Inc., The
Sprout, Waldron & Co.

Chain (Dredge and Shovel)
Manganese Steel Forge Co.

Chain Drives
*Link-Belt Co.

Chain (Elevating and Conveying)
*Haiss Mfg. Co., Geo.
*Link-Belt Co.
Manganese Steel Forge Co.
*McLanahan and Stone Corp.
Sprout, Waldron & Co.

Chutes and Chute Liners
Goodyear Tire & Rubber Co.
*Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
McCarter Iron Works, Inc., The
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
*Smidth & Co., F. L.
Sprout, Waldron & Co.

Classifiers
*Deister Machine Co.
Lewistown Foundry & Machine Co.
*Link-Belt Co.
*Nordberg Mfg. Co.
Straub Mfg. Co.

Clips (Wire Rope)
*American Steel & Wire Co.
*Roebling's Sons Co., John A.

Clutches
*Link-Belt Co.
Sprout, Waldron & Co.

*See also information in the 1939 Pit and Quarry HANDBOOK.

ASPHALT PLANTS

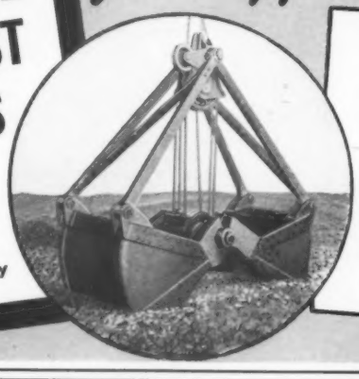
HOT & COLD MIX—ANY CAPACITY
PORTABLE OR STATIONARY
STEAM — ELECTRIC OR DIESEL

THE SIMPLICITY SYSTEM COMPANY
CHATTANOOGA, TENNESSEE

INDUSTRIAL BROWNHOIST BUCKETS

ROPE-REEVE
POWER-WHEEL
LEVER-ARM
LINK-TYPE
½ to 15 Yards Capacity

for Bigger Output at Lower Costs



The value of our forty years experience in building better buckets is best demonstrated by the enthusiastic comments of their owners. Here is one recently received. "We are handling more coal with our new Industrial Brownhoist 1¼-yard Clam-shell than we ever did with our old 2-yard bucket."

Because the new Industrial Brownhoist buckets are designed to meet today's materials handling problems, increased production and profits invariably result wherever they are used.

Get the complete facts from Booklet 353. Send for a copy.

INDUSTRIAL BROWNHOIST CORP., BAY CITY, MICHIGAN
District Offices:
New York · Philadelphia · Pittsburgh · Cleveland · Chicago

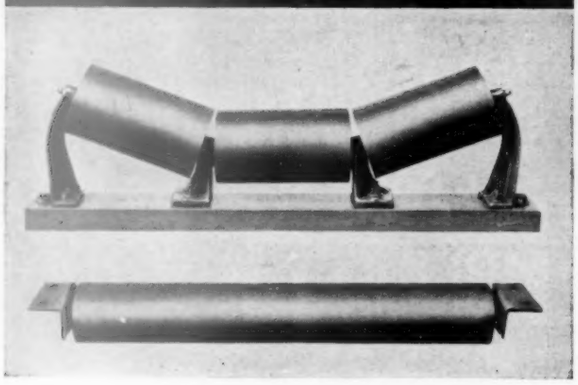
Sterling **QUARRY TRUCKS—BUILT FOR QUARRY WORK**

Performance, Economy, Dependability, and Sturdiness constitute the foundation upon which Sterling has built its reputation as a superior motor truck. Sterling motor trucks have been adopted by leading contractors everywhere who demand unfaltering service, large payloads, and low operating costs. Because Sterlings are built to meet your operating conditions, you are assured long, dependable service and greater profits.

Write for Literature Describing the New Models

STERLING MOTORS CORPORATION
MILWAUKEE, WIS.
Factory Branches in Principal Cities

CONVEYOR IDLERS



That are easy on Belts

The function of the Idler is to properly support the belt and permit it to move with the least possible friction. Robins Idlers do just that. Robins Idler Pulleys are equipped with roller or ball bearings and have the patented "One-Shot" lubricating system. Complete greasing can be done from either side of conveyor without reaching under or over the belt. Bearing adjustment is automatic. Robins Idlers are easy on belts.

ROBINS CONVEYING BELT COMPANY

MATERIAL HANDLING ROBINS EQUIPMENT

15 Park Row, New York, N. Y.

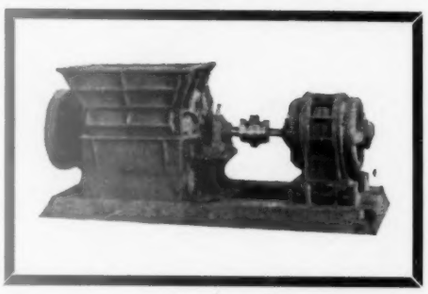
Offices in principal cities

SEND FOR LITERATURE

A SQUARE Deal in Rock Reduction

AMERICAN

HAMMERMILLS



RING MILLS

CRUSHERS

If your crusher is AMERICAN made, you can be sure that it is worthy of the name. It combines maximum durability with high efficiency crushing and produces uniform cubical materials. Low power consumption and minimum maintenance reduce your costs to an all time low.

Consult AMERICAN engineers—they can solve your crushing problems on a new economy basis.

Ask for Bulletin

AMERICAN PULVERIZER CO.

1245 MACKLIND AVE. ST. LOUIS, MO.

BUYERS' GUIDE

A Directory of Pit and Quarry Advertisers Indexed According to Product.

Index to Advertisers on Page 96

Coal-Pulverizing Equipment
- *Raymond Pulverizer Division of the Combustion Engineering Co.
- *Smidth & Co., F. L.
- *Traylor Engr. & Mfg. Co.
- *Universal Crusher Co.
- *Williams Patent Crusher & Pulverizer Co.

Compressors (See Air Compressors)

Concentrators (Slurry)
- *Deister Concentrator Co.

Concrete Mixers
- *Blaw-Knox Co.
- *Erie Steel Construction Co.
- *Jaeger Machine Co.
- *Koehring Co.
- *Smith Co., T. L.

Concrete Products Plant Equipment
- *Universal Concrete Pipe Co.

Concrete Slab Raising Equipment (Mud Jacks)
- *Koehring Co.

Cones (Sand-Washing)
- *Link-Belt Co.
- Smith Engr. Works

Conveyor Belting
- Goodyear Tire & Rubber Co.
- *Haiss Mfg. Co., Geo.
- *Link-Belt Co.
- Republic Rubber Co.
- *Robins Conveying Belt Co.
- Sprout, Waldron & Co.

Conveyor Idlers and Rolls
- *Barber-Greene Co.
- *Haiss Mfg. Co., Geo.
- *Link-Belt Co.
- *Robins Conveying Belt Co.

Conveyors and Elevators
- Bacon, Inc., Earle C.
- *Barber-Greene Co.
- Chicago Steel Fdry. Co.
- *Fuller Company
- *Gruendler Crusher & Pulverizer Co.
- *Haiss Mfg. Co., Geo.
- *Hendrick Mfg. Co.
- Industrial Brownhoist Corp.
- Lewistown Foundry & Machine Co.
- *Link-Belt Co.
- McLanahan & Stone Corp.
- New Holland Machine Co.
- *Robins Conveying Belt Co.
- Smith Engr. Works
- Sprout, Waldron & Co.
- Straub Mfg. Co.
- *Universal Crusher Co.

Conveyors (Pneumatic)
- *Fuller Company

Conveyors (Ready-Mixed Concrete)
- *Blaw-Knox Co.
- *Haiss Mfg. Co., Geo.
- *Jaeger Machine Co.
- *Link-Belt Co.
- *Robins Conveying Belt Co.

Coolers (Clinker)
- *Fuller Co.
- Link-Belt Co.
- *Smidth & Co., F. L.
- *Traylor Engr. & Mfg. Co.

Coolers (See Kilns and Coolers—Rotary)

Correcting Basins
- *Smidth & Co., F. L.

Couplings (Flexible and Shaft)
- *Link-Belt Co.
- *Robins Conveying Belt Co.
- Sprout, Waldron & Co.

Cranes (Crawler and Locomotive)
- *Bay City Shovels, Inc.
- *Bucyrus-Erie Co.
- Harnischfeger Corp.
- Industrial Brownhoist Corp.
- *Koehring Co.
- *Link-Belt Co.

Cranes (Electric Traveling)
- *Erie Steel Construction Co.
- Industrial Brownhoist Corp.

Cranes (Overhead)
- *Erie Steel Construction Co.
- Harnischfeger Corp.
- Industrial Brownhoist Corp.

Crusher Parts
- Alloy Steel & Metals Co.
- *American Pulverizer Co.
- McLanahan and Stone Corp.
- *Traylor Engr. & Mfg. Co.
- *Universal Crusher Co.

Crushers (Cone)
- *Nordberg Mfg. Co.

Crushers (Hammer)
- *American Pulverizer Co.
- *Brooks Equip. & Mfg. Co.
- *Gruendler Crusher & Pulverizer Co.
- Straub Mfg. Co.
- *Universal Crusher Co.
- *Williams Patent Crusher & Pulverizer Co.

Crushers (Jaw and Gyratory)
- Alloy Steel & Metals Co.
- Bacon, Inc., Earle C.
- Brooks Equip. & Mfg. Co.
- *Gruendler Crusher & Pulverizer Co.
- Lewistown Foundry & Machine Co.
- *McLanahan and Stone Corp.
- New Holland Machine Co.
- *Nordberg Mfg. Co.
- Smith Engr. Works
- Straub Mfg. Co.
- *Traylor Engr. & Mfg. Co.
- *Universal Crusher Co.

Crushers (Ring)
- *American Pulverizer Co.
- *Williams Patent Crusher & Pulverizer Co.

Crushers (Roll)
- *American Pulverizer Co.
- *Brooks Equip. & Mfg. Co.
- *Gruendler Crusher & Pulverizer Co.
- *Link-Belt Co.
- McLanahan and Stone Corp.
- New Holland Machine Co.
- *Robins Conveying Belt Co.
- Straub Mfg. Co.
- *Universal Crusher Co.
- *Williams Patent Crusher & Pulverizer Co.

Crushers (Rotary)
- *American Pulverizer Co.
- New Holland Machine Co.
- *Williams Patent Crusher & Pulverizer Co.

Crushing Rolls
- Alloy Steel & Metals Co.
- *Link-Belt Co.
- McLanahan and Stone Corp.
- New Holland Machine Co.
- Straub Mfg. Co.
- *Traylor Engr. & Mfg. Co.
- *Williams Patent Crusher & Pulverizer Co.

*See also information in the 1939 Pit and Quarry HANDBOOK.

Cutter Heads (Dredging)
*Eagle Iron Works

Detonators
National Powder Co.

Diesel Engines (See Engines—Diesel)

Dippers and Teeth (Power Shovel)
*Bucyrus-Erie Co.
*Koehring Co.

Dragline Cableway Excavators
*Bucyrus-Erie Co.
*Link-Belt Co.
*Sauerman Bros., Inc.

Dragline Excavators
*Bay City Shovels, Inc.
*Bucyrus-Erie Co.
*Erie Steel Construction Co.
Harnischfeger Corp.
Industrial Brownhoist Corp.
*Koehring Co.
*Link-Belt Co.

Draglines (Walking)
*Bucyrus-Monighan Co.

Dredges
*Bucyrus-Erie Co.
Hetherington & Berner, Inc.
*Morris Machine Works

Driers
Cummer & Son Co., The F. D.
Lewistown Fdry. & Machine
*Link-Belt Co.
McCarter Iron Works, Inc., The
McLanahan & Stone Corp.
*Traylor Eng. & Mfg. Corp.
Tyler Co., W. S.

Drill Bit Reconditioning
*Bucyrus-Erie Co.

Drilling Accessories
*Bucyrus-Erie Co.
Timken Roller Bearing Co.

Drilling Cables
Wall Rope Works, Inc.

Drilling Contractors
Hoffman Bros. Drilling Co.
Pennsylvania Drilling Co.

Drills (Blast-Hole)
*Bucyrus-Erie Co.

Drills (Core)
Hoffman Bros. Drilling Co.
Pennsylvania Drilling Co.

Drills (Diamond)
Hoffman Bros. Drilling Co.
Pennsylvania Drilling Co.

Drills (Wagon)
*Bucyrus-Erie Co.

Drills (Water Well)
*Bucyrus-Erie Co.

Drills (Well) (See Drills—Blast-Hole)

Drives (Multiple Belt, Chain, Rope)
*Link-Belt Co.

Dust Arresters
*Blaw-Knox Co.
*Buell Engineering Co.
*Parsons Engineering Corp.

Dust Collecting Systems
*Blaw-Knox Co.
McCarter Iron Works, Inc., The
*Parsons Engineering Corp.
*Raymond Pulverizer Division of the Combustion Engineering Co.

Dust Conveying Systems
Allen-Sherman-Hoff Co.
*Blaw-Knox Co.
*Buell Engineering Co.
*Fuller Company
*Parsons Engineering Corp.

Dust Filters
*Buell Engineering Co.
*Parsons Engineering Corp.

Dynamite (See Explosives)

Electric Cables (See Cables—Electric)

Elevator Belting (See Belting)

Elevator Buckets (See Buckets—Elevator and Conveyor)

Elevators (See Conveyors and Elevators)

Eliminators (Soft Stone) (See Soft Stone Eliminators)

Engineers
Bacon, Inc., Earle C.
*Fuller Company
Hetherington & Berner, Inc.
McLanahan and Stone Corp.
*Robins Conveying Belt Co.
*Smidth & Co., F. L.
Sprout, Waldron & Co.
*Traylor Engr. & Mfg. Co.
Wellman Engineering Co.

Engine Generator Sets
See Generator Sets (Engine).

Engines (Diesel)
*Nordberg Mfg. Co.

Engines (Internal-Combustion)
*Nordberg Mfg. Co.

Engines (Steam)
*Morris Machine Works
*Nordberg Mfg. Co.

Excavating Machinery (See Shovels; Cranes; Buckets, etc.)

Excavators—Shallow Grading (Bucket Elevator Type)
*Haiss Mfg. Co., Geo.

Explosives
National Powder Co.

Feeders
*Fuller Company
*Link-Belt Co.
McCarter Iron Works, Inc., The
*McLanahan and Stone Corp.
*Merrick Scale Mfg. Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.
*Universal Crusher Co.

Fuses (Detonating)
*Ensign-Bickford Co.
National Powder Co.

Gas Producers
Wellman Engineering Co.

Gaskets
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Gasoline Engines (See Engines—Internal-Combustion)

Gates (Bin) (See Bin Gates)

Gates (Clamshell)
*Haiss Mfg. Co., Geo.
*Link-Belt Co.

Gears (Herringbone)
*Link-Belt Co.
Sprout, Waldron & Co.

Gears and Pinions
*Haiss Mfg. Co., Geo.
*Link-Belt Co.
Sprout, Waldron & Co.

Gelatin (See Explosives)

Generators (See Motors and Generators)

Glass Sand Equipment
Lewistown Foundry & Machine Co.

* See also information in the 1939 Pit and Quarry HANDBOOK.

Ask your operator—

When it comes to shovel performance *ask your operator* about the time and effort lost with the ordinary dipper trip—then tell him all BAY CITY shovels are equipped with patented Electric Dipper Trip with push button on top of swing lever. Like others, he can get you 10 to 15% more daily yardage with this feature alone. For complete story, ask for Catalog H-3.

BAY CITY SHOVELS, Inc., Bay City, Mich.

BAY CITY SHOVELS

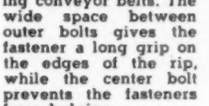
Keep your conveyor belts going with

FLEXCO

HD BELT FASTENERS

• FLEXCO H D RIP PLATES are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.

• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.



• FLEXCO H D BELT FASTENERS make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Five sizes in steel and alloys.

Folder WRP shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.

FLEXIBLE STEEL LACING COMPANY
4623 Lexington St., Chicago

Write for your copy

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

BUYERS' GUIDE

A Directory of Pit and Quarry Advertisers Indexed According to Product.

Index to Advertisers on Page 96

Grab Buckets (See Buckets—Clamshell, Orange - Peel, etc.)

Grapples
*Erie Steel Construction Co.
Owen Bucket Co.

Grating (Steel)
*Blaw-Knox Co.
*Hendrick Mfg. Co.

Grinding Balls (See Balls, Grinding)

Grizzly Feeders
*Link-Belt Co.
*Traylor Engr. & Mfg. Co.

Grizzlies
*Eagle Iron Works
*Hendrick Mfg. Co.
Lewistown Fdry. & Mach. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
*Robins Conveying Belt Co.
Smith Engr. Works

Guards (Wire)
Manganese Steel Forge Co.
*National Wire Cloth Co.

Guns (Hydraulic)
Hetherington & Berner, Inc.
Taylor Forge & Pipe Works

Hammer Mills (See Crushers—Hammer)

Heaters (Bitumen)
McCarter Iron Works, Inc., The

Hitchings (Links, Pins, Clevises)
Sanford-Day Iron Works

Hoists
Commercial Shearing & Stamping Co.
Harnischfeger Corp.
Hetherington & Berner, Inc.
Industrial Brownhoist Corp.
*Jaeger Machine Co.
McLanahan and Stone Corp.
*Sauerman Bros., Inc.
Smith Engr. Works
Sprout, Waldron & Co.

Hoppers
*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.
McCarter Iron Works, Inc., The

Hose (Air, Steam and Water)
Gates Rubber Co.
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Hose (Radiator-Engine Cooling)
Goodyear Tire & Rubber Co.

Hose Couplings (See Couplings)

Hose (Petroleum)
Gates Rubber Co.

Hose (Radiator-Engine Cooling)
Gates Rubber Co.
Republic Rubber Co.

Hydraulic Guns (See Guns—Hydraulic)

Idlers
*Barber-Greene Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Smith Engr. Works
Sprout, Waldron & Co.

Indicators (Material Level)
*Fuller Company

Indicators (Recording Instruments)
Bristol Co.

Kilns and Coolers (Rotary)
*Link-Belt Co.
McCarter Iron Works, Inc., The
*Smidth & Co., F. L.
*Traylor Engr. & Mfg. Co.

Kominuters
*Smidth & Co., F. L.

Ladders (Agitating Dredge)
*Eagle Iron Works

Ladders (Hydraulic Dredge)
*Eagle Iron Works

Lime-Handling Equipment
*Fuller Company
*Link-Belt Co.
*Raymond Pulverizer Division of the Combustion Engineering Co.
*Robins Conveying Belt Co.
*Traylor Engr. & Mfg. Co.

Linings (Ball- and Tube-Mill) (See Mill Liners and Linings)

Loaders and Unloaders
*Barber-Greene Co.
*Bucyrus-Erie Co.
*Fuller Company
*Haiss Mfg. Co., Geo.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Machinery Wearing Parts
Alloy Steel & Metals Co.

Magnetic Pulleys (See Pulleys, Magnetic)

Manganese Steel
Alloy Steel & Metals Co.
Manganese Steel Forge Co.

Manganese Steel (Plates and Sheets)
Alloy Steel & Metals Co.
Manganese Steel Forge Co.

Manganese Steel Castings
Alloy Steel & Metals Co.

Mechanical Rubber Goods
Gates Rubber Co.
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Mill Liners and Linings
Alloy Steel & Metals Co.
*Smidth & Co., F. L.
*Traylor Engr. & Mfg. Co.

Mills (Ball, Tube, etc.)
*Traylor Engr. & Mfg. Co.

Mills (Grinding) (See also Crushers—Hammer)
*American Pulverizer Co.
*Brooks Equip. & Mfg. Co.
*Kennedy-Van Saun Mfg. and Eng. Corp.
Lewistown Fdry. & Mach. Co.
*Raymond Pulverizer Division of the Combustion Engineering Co.
*Smidth & Co., F. L.
Sprout, Waldron & Co.
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.
*Universal Crusher Co.
*Williams Patent Crusher & Pulverizer Co.

Mills (Pug)
McCarter Iron Works, Inc., The

Minerals Separation (Cement) (See Cement Minerals Separation)

Mixers (Asphalt)
Cummer & Son Co., The F. D.
Hetherington & Berner, Inc.
*Link-Belt Co.
McCarter Iron Works, Inc., The
Simplicity System Co.
*Warren Bros. Roads Co.

Mixers (Concrete)
Anchor Concrete Machy. Co.
*Kent Machine Co.
*Link-Belt Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Motor Trucks
Marmon-Herrington Co.
Sterling Motor Truck Co.

Motors and Generators
Harnischfeger Corp.

Motors (Internal-Combustion) (See Engines — Internal-Combustion)

Moulds and Forms (Concrete)
Anchor Concrete Machy. Co.
Dunn Mfg. Co., W. E.
Hollostone Co.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Nails
*American Steel & Wire Co.

Netting (Locomotive Stack)
*Tyler Co., W. S.

Nozzles (Gravel Washing)
*Deister Concentrator Co.

Nozzles (Hydraulic) (See Guns—Hydraulic)

Nozzles (Spray)
*Deister Concentrator Co.
*Link-Belt Co.

Packings
Goodyear Tire & Rubber Co.
Republic Rubber Co.

Pallets
Anchor Concrete Machy. Co.
Commercial Shearing & Stamping Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Partitions (Wire)
*National Wire Cloth Co.

Paving Mixers
*Jaeger Machine Co.
*Koehring Co.

Perforated Metal Plates
Chicago Perforating Co.
*Hendrick Mfg. Co.
*Sprout, Waldron & Co.

Pipe, Dredge (Floating and Shore)
Naylor Pipe Co.
Taylor Forge & Pipe Works

Pipe Flanges
Hetherington & Berner, Inc.
Naylor Pipe Co.
Taylor Forge & Pipe Works

Pipe Fittings
Hetherington & Berner, Inc.

Pipe Forms (Concrete)
Quinn Wire & Iron Works
*Universal Concrete Pipe Co.

Pipe Machines (Concrete)
Quinn Wire & Iron Works
*Universal Concrete Pipe Co.

Pipe (Spiral)
Naylor Pipe Co.
Taylor Forge & Pipe Co.

Pipe (Water, Gas, Low Pressure Steam)
Hetherington & Berner, Inc.

Pipe (Welded)
Naylor Pipe Co.
Taylor Forge & Pipe Co.

Plants (Aggremeter)
*Erie Steel Construction Co.

Plug Valves (See Valves)

Pneumatic Conveying Systems (See Conveyors—Pneumatic)

Pneumatic Drills (See Drills, Rock)

Portable Conveyors
*Barber-Greene Co.
*Fuller Company
Haiss Mfg. Co., Geo.
*Link-Belt Co.
*Robins Conveying Belt Co.
*Universal Crusher Co.

Portable Crushing and Screening Plants
*Barber-Greene Co.
Brooks Equip. & Mfg. Co.
*Gruendler Crusher & Pulverizer Co.
*Link-Belt Co.
*McLanahan and Stone Corp.
*Universal Crusher Co.
*Williams Patent Crusher & Pulverizer Co.

Portable Engines (See Engines—Internal Combustion)

Portable Loaders (See Loaders and Unloaders)

Portable Washing Plants
*Universal Crusher Co.

Powder, (Black, Blasting) (See Explosives)

Power Cables (Rubber Clad)
*American Steel & Wire Co.

Power Shovels (See Shovels, Electric, Internal-Combustion and Steam)

Power Tampers (Concrete)
Anchor Concrete Machy. Co.
Hollostone Co.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

*See also information in the 1939 Pit and Quarry HANDBOOK.

Our Type H Jaw Crusher is the lightest, strongest and most efficient Blake type crusher ever built. See our Bulletin 1105.

" * * We wouldn't part with them * * *"*

TRAYLOR

TY REDUCTION CRUSHER

The above is quoted from a statement by the owner of several TY Crushers, voicing his great satisfaction in their use, at considerable length.

It is no novelty to us, to hear such praise, for we know that the performance of our TY Reduction Crusher will be a revelation to all new users. It is especially intended for all producers who desire to increase their capacity at lower cost.

Investigate this machine. The full story is told in our Bulletin 2112. Yours for the asking!

TRAYLOR ENGINEERING & MANUFACTURING CO.

ALLENTOWN, PENNSYLVANIA, U.S.A.

NEW YORK CITY 3916 Empire State Bldg.
CHICAGO 815 One La Salle St. Bldg.
SALT LAKE CITY 101 West Second South St.
LOS ANGELES 919 Chester Williams Bldg.
SEATTLE 6311 22nd Ave., N. E.
THE CANADIAN FAIRBANKS-MORSE CO., LTD. 980 St. Antoine St., Montreal, P. Q. Canada
B. C. EQUIPMENT CO., LTD. Vancouver, B. C. Canada
MAQUINARIA INTERNACIONAL, S. R. L. Av. Francisco I. Madero No. 17 Desp. 214, Mexico, D. F., Mexico
MANILA MACH. & SUPPLY CO., INC. Manila and Baguio, P. I.

Export Department—104 Pearl St., New York City.

Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Iquique, Oruro

---

Cranes Take Fast, Hefty Swings with a Williams Bucket on the Boom!

- Cranes have limits in lifting power and digging radius. Hanging *too* big a bucket on the boom often defeats its own purpose!

You want *fast* digging, and *big* payloads—and Williams Buckets help you get the best performance from your cranes because Williams welded construction and design eliminate excess weight without sacrificing digging power or durability! You get the most out of your cranes with the right Williams Bucket on the boom or dragline!

A tricky fight manager once stuffed a lot of horseshoes into his fighter's gloves. But he overloaded them so the poor pug could barely lift his hands—and was an easy knockout. *Don't handicap your cranes the same way!*

Send for free bulletins covering the Williams line of Power-Arm, Multiple-Rope, Power-Wheel, Hook-On and Dragline Buckets. Distributors located in all parts of the country for prompt field service.

THE WELLMAN ENGINEERING CO.
7014 CENTRAL AVE. • CLEVELAND, OHIO

WILLIAMS *Buckets built by* WELLMAN

BUYERS' GUIDE

A Directory of Pit and Quarry Advertisers Indexed According to Product.

Index to Advertisers on Page 96

Power Units (Internal Combustion)
*Nordberg Mfg. Co.

Pre-formed Wire Rope
*American Cable Division of The American Chain & Cable Co., Inc.
Broderick & Bascom Rope Co.

Press Machines (Hand, Concrete)
Anchor Concrete Machy. Co.
Hollostone Co.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Proportioning Equipment
*Blaw-Knox Co.
*Erie Steel Construction Co.
Heltzel Steel Form & Iron Co.
*Jaeger Machine Co.
*Merrick Scale Mfg. Co.

Pulleys
*Link-Belt Co.
*McLanahan and Stone Corp.
Sprout, Waldron & Co.

Pulleys (Magnetic)
Sprout, Waldron & Co.

Pulleys (Wing)
Sprout, Waldron & Co.

Pulverized Fuel Systems
*Raymond Pulverizer Division of the Combustion Engineering Co.

Pulverizers (See also Crushers, Mills, etc.)
*American Pulverizer Co.
*Brooks Equip. & Mfg. Co.
*Gruendler Crusher & Pulverizer Co.
Lewistown Foundry & Machine Co.
New Holland Machine Co.
*Raymond Pulverizer Division of the Combustion Engineering Co.
*Smidth & Co., F. L.
Straub Mfg. Co.
Traylor Engr. & Mfg. Co.
*Universal Crusher Co.
*Williams Patent Crusher & Pulverizer Co.

Pump Valves (See Valves, Pump)

Pumps (Air-Lift)
*Fuller Company

Pumps (Bulk Cement)
*Fuller Company

Pumps (Cement Slurry)
*Morris Machine Works
*Smidth & Co., F. L.

Pumps (Centrifugal)
Hetherington & Berner, Inc.
*Jaeger Machine Co.
Kansas City Hay Press Co.
*Morris Machine Works

Pumps (Dewatering)
*Morris Machine Works

Pumps (Dredging)
Bucyrus-Erie Co.
Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works

Pumps (Sand and Gravel)
Hetherington & Berner, Inc.
Kansas City Hay Press Co.
*Morris Machine Works

Pumps (Turbine)
*Morris Machine Works

Pumps (Vacuum)
*Fuller Company

Pumps (Vertical)
*Morris Machine Works

Pumps (Well)
*Morris Machine Works

Racks (Curing)
Anchor Concrete Machy. Co.
Hollostone Co.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Ready-Mixed Concrete Plants
*Erie Steel Construction Co.
Heltzel Steel Form & Iron Co.
*Jaeger Machine Co.

Rock Bit Grinders
Alloy Steel & Metals Co.

Rock Drills (See Drills—Rock)

Rod Mills
*Traylor Engr. & Mfg. Co.

Rope (Wire) (See Wire Rope)

Rope (Manila)
Wall Rope Works, Inc.

Sand and Gravel Handling Equipment
*Link-Belt Co.
*McLanahan and Stone Corp.

Sand Separators
*Link-Belt Co.
McLanahan and Stone Corp.
Smith Engr. Works

Sand-Settling Tanks
*Link-Belt Co.
*Nordberg Mfg. Co.
Smith Engr. Works

Scales
*Merrick Scale Mfg. Co.

Scrapers (Power Drag)
Co.
*Link-Belt Co.
*Sauerman Bros., Inc.

Scrapers (Wagon)
*Bucyrus-Erie Co.

Screens
Bacon, Inc., Earle C.
Chicago Perforating Co.
Cleveland Wire Cloth & Mfg. Co.
Cummer & Son Co., The F. D.
*Deister Concentrator Co.
*Deister Machine Co.
*Eagle Iron Works
*Gruendler Crusher & Pulverizer Co.
*Haiss Mfg. Co., Geo.
*Hendrick Mfg. Co.
Industrial Brownhoist Corp.
Lewistown Foundry & Machine Co.
*Link-Belt Co.
Ludlow-Saylor Wire Co.
Manganese Steel Forge Co.
McLanahan and Stone Corp.
*National Wire Cloth Co.
*Nordberg Mfg. Co.
*Robins Conveying Belt Co.
*Roebling's Sons Co., John A.
Smith Engr. Works
Sprout, Waldron & Co.
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.
*Tyler Co., W. S.
*Universal Crusher Co.

Screens (Vibrating or Shaking)
*Barber-Greene Co.
Cummer & Son Co., The F. D.
*Deister Concentrator Co.
*Deister Machine Co.
*Gruendler Crusher & Pulverizer Co.
Lewistown Foundry & Machine Co.
*Link-Belt Co.
McLanahan and Stone Corp.
New Holland Machine Co.
*Nordberg Mfg. Co.
*Robins Conveying Belt Co.
Screen Equipment Co.
Smith Engr. Works
Sprout, Waldron & Co.
Straub Mfg. Co.
*Tyler Co., W. S.
*Universal Crusher Co.
*Williams Patent Crusher & Pulverizer Co.

Scrubbers
*Link-Belt Co.
*McLanahan and Stone Corp.
*Traylor Engr. & Mfg. Co.
*Tyler Co., W. S.

Separators (Air) (See Air Separators)

Separators (Slurry)
*Smidth & Co., F. L.

Sheaves
*Eagle Iron Works
Gates Rubber Co.
*Gruendler Crusher & Pulverizer Co.
*Haiss Mfg. Co., Geo.
Hetherington & Berner, Inc.
*Link-Belt Co.
McLanahan and Stone Corp.
Sanford-Day Iron Works
Sprout, Waldron & Co.

Shovels (Electric, Internal-Combustion and Steam)
*Bay City Shovels, Inc.
*Bucyrus-Erie Co.
Harnischfeger Corp.
Industrial Brownhoist Corp.
*Koehring Co.
*Link-Belt Co.

Silos
McCarter Iron Works, Inc., The
*Smidth & Co., F. L.

Skip Hoists and Skips
Hetherington & Berner, Inc.
*Link-Belt Co.
McCarter Iron Works, Inc., The
*Robins Conveying Belt Co.

Speed Reduction Units
*Link-Belt Co.

Spouts (See Chutes and Chute Liners)

Sprays
*Deister Concentrator Co.

Sprockets and Chain
*Link-Belt Co.
Sprout, Waldron & Co.
Straub Mfg. Co.

Steel (Alloy)
(See Alloys—Steel)

Steel (High Tensile)
Manganese Steel Forge Co.

Steel (Open Hearth)
Manganese Steel Forge Co.

Steel Grating (See Grating, Steel)

Steel Plate Construction
Heltzel Steel Form & Iron Co.
Hetherington & Berner, Inc.
Manganese Steel Forge Co.
McCarter Iron Works, Inc., The
Sprout, Waldron & Co.

Stone Grapples
Owen Bucket Co.

Storage Equipment
*Erie Steel Construction Co.
*Haiss Mfg. Co., Geo.
*Link-Belt Co.
*Sauerman Bros., Inc.

Tachometers
Bristol Co.

Tamp Machines (Hand, Concrete)
Anchor Concrete Machy. Co.
Hollostone Co.
*Kent Machine Co.
*Multiplex Concrete Machinery Co.
Zagelmeyer Cast Stone Block Machy. Co.

Tanks
Heltzel Steel Form & Iron Co.
*Hendrick Mfg. Co.
*Link-Belt Co.
McCarter Iron Works, Inc., The
*Traylor Engr. & Mfg. Co.

Tanks (Elevated Steel)
*Chicago Bridge & Iron Co.

Tanks (Sand-Settling)
*Link-Belt Co.
Smith Engr. Works

Testing Sieves and Shakers
*Hendrick Mfg. Co.
*Tyler Co., W. S.

Tire Repair Material
Goodyear Tire & Rubber Co.

Tires (Truck, Passenger Car or Tractor)
Goodyear Tire & Rubber Co.

Tools (Drill) (See Drilling Accessories)

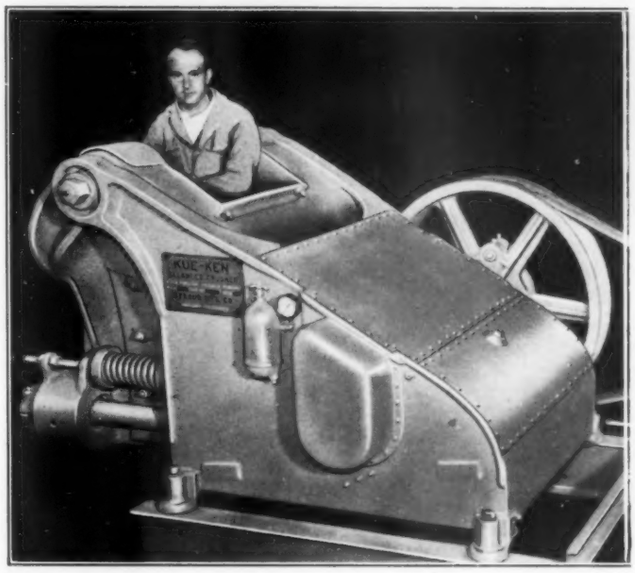
Track Shifters
*Nordberg Mfg. Co.

* See also information in the 1939 Pit and Quarry HANDBOOK.

WHAT'S YOUR BIGGEST CRUSHER EXPENSE?

Is It . . . **FIRST COST?**
. . . **INSTALLATION?**
. . . **LABOR?**
. . . **POWER?**
. . . **JAW PLATES?**
. . . **LUBRICATION?**
. . . **MAINTENANCE?**

Every one of these costs can be cut to the bone with a KUE-KEN balanced crusher. First cost, installation and labor is less because one KUE-KEN will take the place of 2 or more ordinary crushers, screens, elevators, bins, etc. Power consumption and jaw plate wear is less because KUE-KEN crushers crush without abrasion or rubbing (the new KUE-KEN principle). Balanced mechanism allows 90% of the power to be used for crushing rock. Lubrication and maintenance costs are less because bearing pressures are only 1/5 of ordinary crushers and entire mechanism runs in sealed, dust tight oil bath. Our free crushing test service gives definite performance data on your rock.



Wide clear openings top and bottom permit feeding and discharging from any angles. Perfect balance eliminates heavy expensive foundations.

SEND FOR BULLETIN NO. 600 TODAY

STRAUB MFG. CO. 528 CHESTNUT STREET OAKLAND, CALIFORNIA

Spiral Screw Type
Paddle Log Type
EAGLE
Sand and
Gravel Washers

SOARS TO NEW HIGH RECORDS!

The Twin Screw Eagle Washer for those with large capacity requirements. We recommend the Single Screw Washer when demands are smaller.

It takes an "EAGLE"—EVERY time—to establish performance records on sand and gravel cleaning jobs!

A twin screw Eagle Washer for recovering commercial sand was installed by the Concrete Materials Corporation of Waterloo, Ia. It recovers daily over six cars of sand which qualifies for the Illinois State Specifications, although originally only gravel was produced.

"Our Eagle Washer in use every day. Could not do without it; acceptable for any work. Never have rejections from improper preparation. Very little expense and very few repairs." (Name on request.)

Many other users testify to the superior efficiency and operating economy of Eagle Washers. With years of experience these machines have been developed to meet every requirement in the sand and gravel cleaning field—and to do it most profitably.

WATCH AN "EAGLE" SET THE PACE!

Write for our Bulletin describing Eagle Washers; also the Eagle "Swintek" Nozzle Ladder, designed to end all your dredging worries.

EAGLE · IRON · WORKS

129 Holcomb Avenue — Des Moines, Iowa

BUYERS' GUIDE

A Directory of Pit and Quarry Advertisers Indexed According to Product.

Index to Advertisers on Page 96

Trailers
Marmon-Herrington Co.
Sterling Motor Truck Co.

Trailers (Dump)
Sanford-Day Iron Works

Trailers (Industrial)
Marmon-Herrington Co.
Sterling Motor Truck Co.

Tramways (Aerial Wire Rope)
*American Steel & Wire Co.
*Roebling's Sons Co., John A.

Transmission Belting (See Belting)

Transmission Machinery
*Gruendler Crusher & Pulverizer Co.
*Link-Belt Co.

Trippers
*Link-Belt Co.
*Robins Conveying Belt Co.

Truck Cranes (See Cranes)

Truck Mixers
*Blaw-Knox Co.
*Jaeger Machine Co.
*Smith Co., T. L.

Trucks and Trailers (See Motor Trucks)

Tubes for Tire Casing
Goodyear Tire & Rubber Co.

Tube-Mills (See Mills—Ball, Tube, etc.)

Unloaders (Box Car)
*Barber-Greene Co.
*Fuller Co.
*Link-Belt Co.

Valves (Pump)
Taylor Forge & Pipe Works

Variable Speed Reducers or Transmissions
*Link-Belt Co.

Vibrating Screen Plate
Chicago Perforating Co.
*Hendrick Mfg. Co.
*Link-Belt Co.
Manganese Steel Forge Co.

Vibrating Screens (See Screens—Vibrating)

Vibrators
*Link-Belt Co.
*Tyler Co., W. S.

Vibrators (Concrete)
Anchor Concrete Machinery Co.
*Multiplex Concrete Machy. Co.

Wagons (Dump)
*Koehring Co.

Washers (Sand, Gravel and Stone)
*Eagle Iron Works
*Haiss Mfg. Co., Geo.
Lewistown Foundry & Mach. Co.
*Link-Belt Co.
McLanahan and Stone Corp.
*Smidth & Co., F. L.
Smith Engr. Works
Straub Mfg. Co.
*Traylor Engr. & Mfg. Co.
*Tyler Co., W. S.
*Universal Crusher Co.

Wearing Parts (Machinery) (See Machinery Wearing Parts)

Weighing Equipment (Automatic)
*Blaw-Knox Co.
*Erie Steel Construction Co.
*Fuller Co.
Heltzel Steel Form & Iron Co.
*Jaeger Machine Co.
McCarter Iron Works, Inc., The
*Merrick Scale Mfg. Co.

Welding Supplies
*American Steel & Wire Co.
Harnischfeger Corp.
Manganese Steel Forge Co.
*Roebling's Sons Co., John A.

Wheels (Car)
Sanford-Day Iron Works

Winches and Capstans
Alloy Steel & Metals Co.
*Link-Belt Co.
*Robins Conveying Belt Co.
Sprout, Waldron & Co.

Wire and Cable (Electric)
*American Steel & Wire Co.

Wire Cloth
Cleveland Wire Cloth & Mfg. Co.
Ludlow-Saylor Wire Co.
Manganese Steel Forge Co.
*National Wire Cloth Co.
*Robins Conveying Belt Co.
*Roebling's Sons Co., John A.
*Tyler Co., W. S.

Wire Rope
*American Cable Division of The American Chain & Cable Co., Inc.
*American Steel & Wire Co.
Broderick & Bascom Rope Co.
*Roebling's Sons Co., John A.

Wire Rope Fittings
*American Cable Division of The American Chain & Cable Co., Inc.
*American Steel & Wire Co.
Broderick & Bascom Rope Co.
*Roebling's Sons Co., John A.

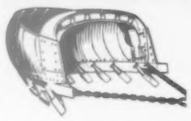
Wire Rope Slings
*American Cable Division of The American Chain & Cable Co., Inc.
*American Steel & Wire Co.
Broderick & Bascom Rope Co.
*Roebling's Sons Co., John A.

Wire (Welding)
*American Steel & Wire Co.
Manganese Steel Forge Co.
*Roebling's Sons Co., John A.

Worm Gears (See Gears and Pinions)

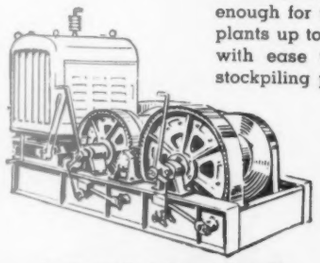
* See also information in the 1939 Pit and Quarry HANDBOOK.

Costs Reduced
. . . ON TOUGH EXCAVATING JOBS



Sauerman Crescent Scraper Bucket

Sauerman Slackline Cableway Bucket



Sauerman Two-Drum Hoists for Scraper and Slackline Machines

Sauerman Scrapers and Slackline Cableways offer the most satisfactory solutions for all material-handling problems requiring machinery that will dig, convey and automatically dump. These machines will dig any material that a plough can penetrate. One man controls the entire operation. Power and maintenance cost are exceedingly low per cubic yard of material handled.

A Sauerman machine digs with equal facility under water, on mushy ground, on a hillside or in a rough pit. Operation is continuous—digging, hauling and automatic dumping—without other labor or handling equipment. The sizes range from machines small enough for use with portable crushing plants up to machines that can handle with ease the largest excavating or stockpiling project.

Tell us about your problems. We will offer our advice and send you our catalog.

SAUERMAN BROS., INC.
434 S. Clinton St.
CHICAGO, ILLINOIS

SAUERMAN LONG RANGE MACHINES

When ONE Truck does the work of FIVE— that's COST CUTTING!

WHEREVER LOADING IS DONE BY HAND, one Brooks Load-Lugger and 5 to 10 Load-Lugger Buckets may replace an equal number of trucks, distance of haul considered. Cut hauling investments of unnecessary trucks . . . stop the heavy time and money loss of trucks standing idle for loading. In excavation work, stone quarries, road work, concrete aggregate hauling, W.P.A. projects, snow removal, and countless other operations, the Brooks Load-Lugger means tremendous savings. Built in four capacities . . . mountable on any truck chassis in a few hours. ONE PIECE Buckets. Write or wire for details and completely illustrated folder NOW.

BROOKS EQUIPMENT & MFG. CO.
91 Davenport Road, Knoxville, Tenn.

CUT FUEL COSTS

. . . by using PYRASTEEL Kiln Ends

PYRASTEEL FOR HIGH TEMPERATURES

Do you know that Pyrasteel Kiln Ends quickly pay back their cost in extra economies?

They make tight sealing possible and reduce coal consumption as much as 10 tons per day for an average 2000-barrel plant.

Their endurance under continuous high temperatures eliminates shut-downs for renewals every year they are in use.

Drag Chains of EVANSTEEL

Cooler Plates of PYRASTEEL

Screw Conveyors of EVANSTEEL

Feed Pipes of PYRASTEEL

Ask for Bulletin

CHICAGO STEEL FOUNDRY COMPANY
37th Street and Kedzie Avenue, CHICAGO, ILLINOIS
MAKERS OF ALLOY STEEL FOR OVER 25 YEARS

Try this

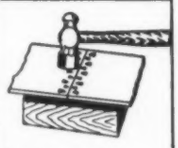
QUICK, EASY, LOW-COST way of repairing and joining your conveyor belts and power belts

REPAIRING your conveyor belts and joining your power belts with Bristol's Steel Belt Fasteners is really as simple as A-B-C. Just a hammer, a block of wood, and your hands—that is all you need to make a tight, lasting, sound repair or joint that will stand up in the hardest service.

No loosening. No tearing. No coming out. Supplied in sizes and styles for belts of every thickness and every material. Write for Bulletin 72-5W.

THE BRISTOL COMPANY
MILL SUPPLY DIV. WATERBURY, CONN.
Branches in principal cities

1 Hammer through.



2 Clinch points.

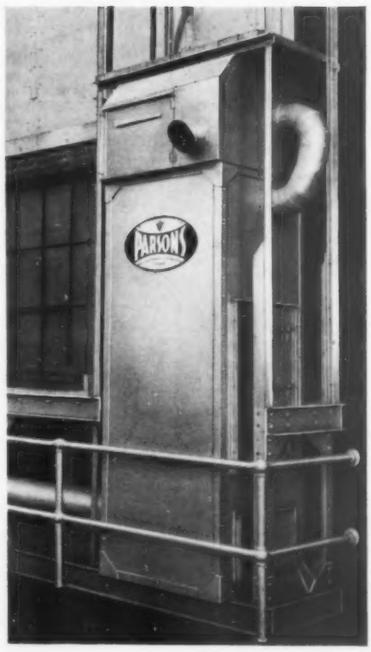
3 Conveyor belt repairs now easy, quick, low-cost.

BRISTOL'S
TRADE MARK REG. U.S. PAT. OFF.
STEEL BELT FASTENERS

PARSONS NOW MAKES IT POSSIBLE

FOR EVERY ROCK CRUSHING PLANT TO *INSTALL A*

DUST ARRESTER



The dust generated in an average size Rock Crushing Plant can be handled with approximately 2000 cubic feet of air. The dust points are at the crusher, elevator and conveyor discharging into bins.

The PARSONS Unit Type Dust Arrestor, shipped assembled and complete with Fan and 5 HP. motor will efficiently handle this volume of air—overcome the dust nuisance—and at a cost within the reach of every operator—approximately $625.

The illustration at the left is of a PARSONS Unit Type Dust Arrestor with the fan and drive mounted overhead. Just set it in place and connect dust pipe into expansion chamber. You can't find anything more simple—yet as efficient.

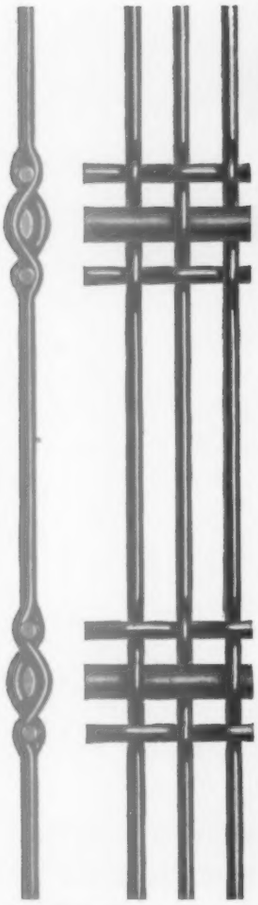
PARSONS Dust Collecting Systems have been used by Rock Crushing and Cement Plants for more than 15 years. "It's Our Treat—try one—if you like it keep it—if not send it back at our expense.

Write for bulletin DA-6.

Dust Arresters and Complete Exhaust Systems

PARSONS

PARSONS ENGINEERING CORPORATION
3595 E. 82ND STREET CLEVELAND, OHIO



STA-TRU

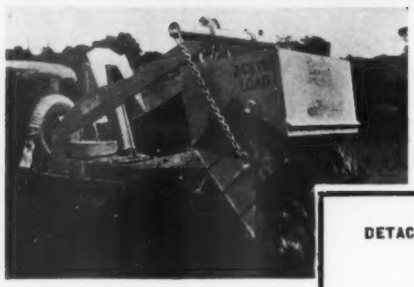
Long-Mesh
Woven Wire Screens

made to work under tension and vibration.

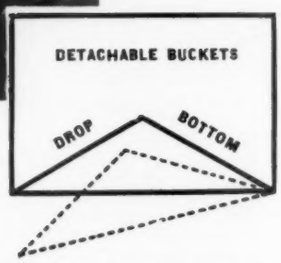
The straight stay - bars carry ALL the tension. The crimps in the round wires can not be stretched or broken. The screen can not be caused to sag or split by the pull of the tensioning device.

LUDLOW-SAYLOR
WIRE CO. **ST. LOUIS**

DEMPSTER DUMPSTER



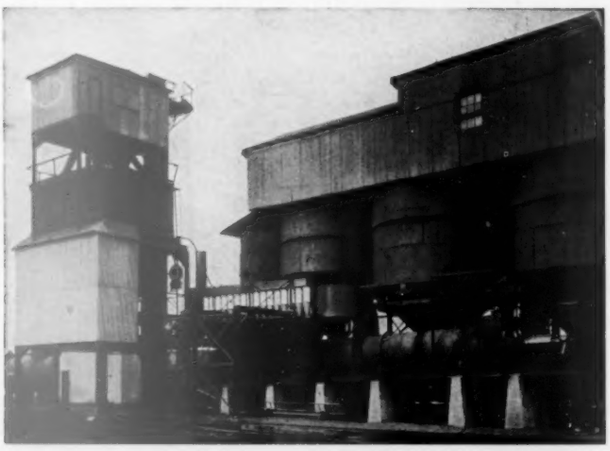
No Overhang
No Sidesway
No Counterweight



Precision Controlled Dumping

Exclusive features and advantages such as superior bucket design, easier operating control, sturdier construction, and drop bottom have put the DEMPSTER-DUMPSTER "out in front" as material handling equipment. Buckets are carried up and on the truck chassis with more than 50% of the load ahead of the rear axle.

DEMPSTER BROS. INC.
KNOXVILLE, TENNESSEE



WARREN ASPHALT PLANTS
HOT MIX —— COLD MIX
—— OR ——
COMBINATION UNIT FOR BOTH TYPES
CAPACITY DESIGN AND ARRANGEMENT TO MEET ANY REQUIREMENTS

Designed and Built
—— By ——
WARREN BROTHERS ROADS CO.
P. O. BOX 1869
Boston Massachusetts

ROUND
SQUARE
SQUAROUND*
HEXAGON
PERFORATED PLATE
of every description
for maximum productiveness from your vibrating screens.
*Reg. U.S.Pat. Off.

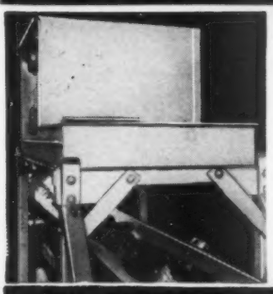
HENDRICK MANUFACTURING CO.
39 Dundaff Street, Carbondale, Pa.
Sales Offices in Principal Cities. Please Consult Telephone Directory

Lewistown Foundry Products
ARE
Performance-Tested

BUCKET ELEVATORS
REVOLVING SCREENS
CRUSHERS DRY PANS

Lewistown Foundry & Machine Co.
Lewistown, Pa.

WEIGHING while conveying



WITH THE

MERRICK WEIGHTOMETER

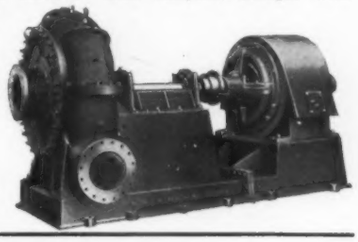
Applicable to any size belt conveyor, horizontal or inclined. An accurate and dependable means of keeping constant check on production.

WRITE FOR BULLETIN 375

MERRICK SCALE M'FG. CO.
PASSAIC NEW JERSEY

MORRIS
CENTRIFUGAL PUMPS

For hydraulic dredging, filling, sand and gravel production, hydraulic conveying of slurry and other liquids containing abrasive materials, clear water pump for general service. Also complete dredges with all accessory equipment. Dredging pump designs include heavy-duty types and special alloy parts for severe service. Types and sizes for the largest or smallest operations, and belt, motor, steam, oil or gasoline-engine drive.

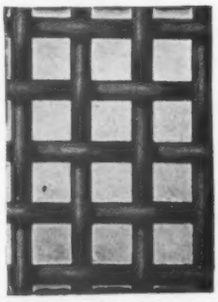


Write for Bulletins

Morris Machine Works
Baldwinsville, N. Y.

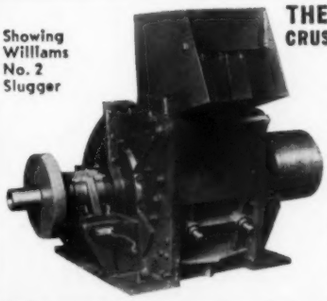
5 STAR FEATURES
Of Nat-Aloy Wire Cloth

- ★ Wears five times as long as cloth made of ordinary steel.
- ★ Withstands vibration without crystallization.
- ★ Super-tough to resist abrasion.
- ★ Maintains accuracy throughout life of screen.
- ★ Has outworn other special alloy cloths.



ATTRACTIVE PRICES
STOCK SHIPMENTS

NATIONAL WIRE CLOTH CO. INC.
ST. PAUL, MINN.
Write for New Catalog



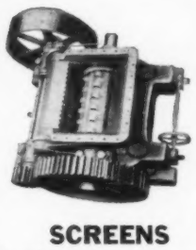
Showing Williams No. 2 Slugger

THE WILLIAMS "SLUGGER" CRUSHER *for* MAKING 1¼", ¾" OR AGSTONE HANDLES LARGE STONE

Rows of heavy, free swinging, fast revolving hammers, crush the material by impact until of proper size to pass through the grates. By reducing large rock to 1¼", ¾" or agricultural size in one operation, the "Slugger" has enabled operators to produce these sizes at a very low cost per ton and with small investment.

WILLIAMS PATENT CRUSHER AND PULVERIZER COMPANY
802 St. Louis Ave. - St. Louis, Mo.

Williams
PATENT CRUSHERS GRINDERS SHREDDERS



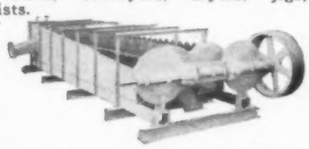
McLANAHAN EQUIPMENT

CRUSHERS

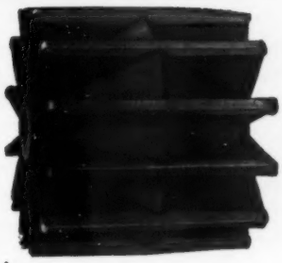
Single and double roll and jaw crushers, hammer mills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists.

SCREENS

Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.



McLanahan & Stone Corp. *Established 1835* HOLLIDAYSBURG, PENNSYLVANIA



CONVEYORS LAST LONGER

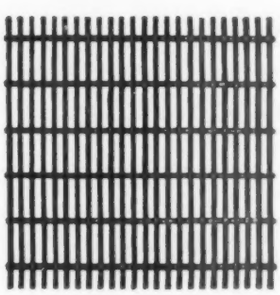
where SPROUT-WALDRON Wing Pulleys are used. The same is true of your Elevator belts.

Material conveyed cannot lodge between belt and pulley to cut your belts.

Interchangeable with standard pulleys.

Write for catalog

SPROUT, WALDRON & CO., INC.
1221 SHERMAN ST., MUNCY, PA.
Elevating, Conveying and Transmission Equipment



Rolled Slot

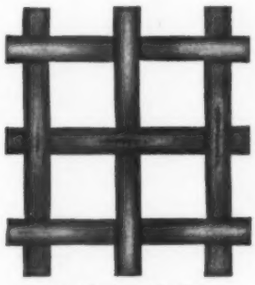
ALLOY No. 2

A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

"CLEVELAND" SCREENS

A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

THE CLEVELAND WIRE CLOTH & MFG. COMPANY
574 E. 78th St. CLEVELAND, OHIO

$17.50 PER SET

CAN BE QUICKLY ATTACHED TO YOUR OWN GRINDING EQUIPMENT

ROCK BITS KEPT SHARP

and drilling goes faster with a Pacific grinding attachment . . . Simple, convenient, practical . . . Any handy man can use it . . .

No special form wheels needed . . . Designed for standard wheels easily obtained from your nearby dealer.

The parts comprising this attachment are shown in lighter areas in above illustration. When desired, we can supply the complete unit including wheel, electric motor, etc.

When ordering specify MAKE AND THREAD SIZE of bit to be ground.

Ask Your Dealer

PACIFIC Detachable Drill Bit **GRINDER**

ALLOY STEEL & METALS CO.

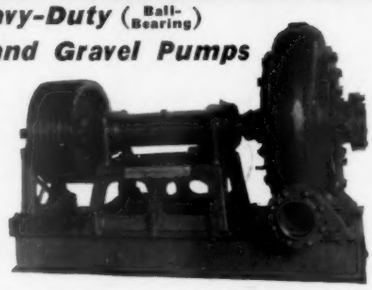
1862 E. 55TH STREET • LOS ANGELES, CALIF., U. S. A.

Manufacturers of Pacific Jaw Crushers • Pacific Bit Grinders
Handy Hoists • Machinery Wearing Parts

LIGHTNING

Heavy-Duty (Ball-Bearing) ***Sand and Gravel Pumps***

High efficiency—low operating cost—precision workmanship—wear-resisting, non-heating bearings even when operated under extremely high heads. WRITE



KANSAS CITY HAY PRESS CO.
KANSAS CITY, MO.

Stripping Costs High?

Check up on S-D Automatic Bottom Dumping Trailers. The trailer that gives you continuous operation . . . discharging and closing on the run, with no auxiliarly powered mechanisms. Built for heavy service and easy, fast manipulation. Here's the trailer for stripping hauling and dumping costs to rock bottom. Let an S-D engineer tell you why.

SANFORD-DAY IRON WORKS, 702 DALE AVENUE, **Knoxville, Tenn.**

BROADCAST SECTION

BOILERS: 100 H.P. and one 80 H.P. National Board, locomotive type, on skids, 125 lbs. pressure.

SHOVELS: Bucyrus Erie 50-B steam shovel, 2 yd. crawler tread, full revolving. Also one General gas shovel, 1¼ yd., with or without crane boom and ½ yd. clamshell bucket.

CRUSHING ROLLS: Allis-Chalmers 24" Face, 54" Diameter.

DIESEL OIL ENGINE: Cooper-Bessemer 450 H.P. 4 cylinder, 4 cycle, 225 R.P.M., with or without 300 KW-A.C. generator.

LOCOMOTIVES: Vulcan 25 ton, standard gauge gas locomotive. Also one Vulcan 25 ton standard gauge steam locomotive.

JAW CRUSHER: 24"x36" late type, used less than nine months.

REDUCTION CRUSHER: Kennedy model 25, gearless, V-belt drive, with or without 50 H.P. vertical motor. Also Traylor 8" type T reduction crusher.

COMPRESSORS: Ingersoll-Rand electric compressor, 2 stage, 676 cu. ft. with 100 H.P. motor, short belt drive, used nine months. Also Ingersoll-Rand 10x8, capacity 320 cu. ft. Waukesha motor, on steel wheels, condition guaranteed, bargain.

DREDGE PUMP: Morris 6" complete with motor and all auxiliary equipment for 6" dredge.

PULVERIZER: Hardinge Mill, 5'x22".

CLAMSHELL BUCKETS: One Blaw Knox 1½ yd. digging type. Also one Hayward 2 yd. material handling type.

BELT CONVEYOR: 40"x395' roller bearing equipped.

DRYER: 42"x25', single shell.

MINE SLOPE HOIST: One mine slope hoist, single drum, electric, 30" Dia., 48" Face, with 100 or 150 H.P. motor.

A. J. O'NEILL
Lansdowne Theatre Bldg.
Lansdowne **Penna.**
Philadelphia 'Phone—Madison 7578

FOR SALE

CLIMAX 4-cylinder gasoline engine, 65 horsepower, steel skid mounted, with clutch and pulley.

TROY SLAG PRODUCTS COMPANY
Foot of Monroe Street
Troy **N. Y.**

FOR SALE

2—200 HP. Fairbanks-Morse Full Diesel Engines, direct connected to 170 KVA. Generators.
1—300 HP. Fairbanks-Morse, Type Y, Style V, Engine, direct connected to an A.C. Generator.
1—200 HP. Fairbanks-Morse, Type Y, Style V, Engine.
1—100 HP. Fairbanks-Morse, Type Y, Style V, Engine.
1—Anderson Oil Engine, direct connected to a 165 KW. A.C. Generator.

Complete stock of Air Compressors, Motors, Pumps and Boilers.

Let us have your inquiries.

FLETCHER SALES COMPANY
835 Security Trust Bldg. **Indianapolis, Ind.**

Large Capacity Dragline Bargain

Marion 8-yard capacity steam dragline, 8 years old, original cost $100,000; truck mounted, 150 ft. boom, oil fired boilers recently retubed, all in good condition except cab requires some rebuilding. Price, $25,000. Terms: $10,000 cash, balance $1,000 per month.

Box 418
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. **Chicago, Ill.**

FOR SALE

Asphalt pug mill, speed reducer, and weighing batcher.
610 and 1302 CFM. air compressors.
150 ton 3 compartment bin with scales.
80 H.P. Locomotive type boiler.
30" x 30" Jeffry single roll crusher.

ACME EQUIPMENT CO.
Box 147 **Allison Park, Pa.**

FOR SALE

200 H.P. Scotch Boiler, 160 lbs.

R. B. HOBSON
Great Notch **New Jersey**

Advertise
Your "Wants"
and
Surplus
Equipment

Consolidated Offers:

Equipment Remaining at Sand & Gravel Plant Near Utica, New York

1—36x18" Farrel-Bacon Jaw Crusher, with V-belt drive and 100 H.P. motor.

6—Robins Belt Conveyors, roller bearing idlers, Goodyear belt.
30"—212' c/c; 24"—237' c/c;
20"—212', 252', 288', 302' c/c.

7—Traylor Vibrating Screens; 2 FB-2 and 5 FB-4, 48" x 84" double deck.

1—6" Rumsey Centrifugal Pump with direct connected 100 H.P. motor.

3—Rotary Scrubbers or Washers, 4' x 6' and 4' x 8', each with 20 H.P. motor.

4—Sand Boxes or Drags; 2—18' c/c with 4' wide blades, 2—24' c/c with 3' wide blades.

SEND FOR DETAILED ILLUSTRATED CIRCULAR OF THESE AND OTHER ITEMS AT PLANT

Equipment Remaining at White Cliffs, Ark., Plant

2—4-roll Raymond High Side Pulverizers.

1—5' x 30' Ruggles-Coles Direct Heat Rotary Dryer.

1—30" x 54" Single Roll Crusher.

1—No. 4 Williams Jumbo Hammer Mill.

8—18" Belt Conveyors, various lengths.

2—40' Bucket Elevators, 9 x 18" buckets.

1—No. 30 Caterpillar Tractor.

1—60 H. P. Fairbanks-Morse Diesel Engine.

1—10x8" Ingersoll-Rand Air Compressor.

1—No. 1½ Loomis Well Drill.

Selected Items:

1—55 ton Gasoline Electric Locomotive, standard gauge, 8-wheels, in two swiveling trucks. Westinghouse Generators and Motors. American La-France Engines. (Send for detailed specifications and photographs).

1—25-ton Browning Locomotive Crane. At Belleville, Mich. New A.S.M.E. boiler last year.

1—42"x48" Traylor Jaw Crusher.

1—4 ft. Traylor Finishing Crusher, No. 410 TZ.

1—5'x36" Vulcan Tube Mill, iron lined, 3 compartment. Used one week.

1—20" x 4'6" Schaeffer Poidometer.

9—Rotary Dryers; 3x20', 4x30', 5x26', 5x30', 6x40', 6x60', 8'8"x85'.

2—4'x8' Robins Vibrating Screens, 2 deck.

4—3'6' Sturtevant MV Screens, 2 deck.

8—Tyler Hummer Screens; 3x5, 4x5, 4x7.

1—10' Sturtevant Air Classifier.

• Write for Detailed Illustrated Circulars—Address All Inquiries To:

Consolidated Products Co., Inc.

17-19 PARK ROW - NEW YORK CITY • BARCLAY 7-0600

D. C. MOTORS

230 Volts Constant Speed

Qu.	Hp.	Make	Type	Speed
21	2	Whse.	SK	850
11	3	Whse.	CD	1725
2	3	Whse.	SK	1750
142	3	Whse.	SK	1150
18	3½	Whse.	SK	850
17	5	Whse.	CD	3450
19	5	Whse.	SK	1750
165	5	Whse.	SK	1150
129	5	Whse.	SK	850
37	7½	Whse.	SK	1750
21	7½	Whse.	SK	1150
86	7½	Whse.	SK	850
22	10	Whse.	SK	1750
17	10	Whse.	SK	1150
76	10	Whse.	SK	850
34	15	Whse.	SK	1150
10	15	Whse.	SK	825
16	15	Whse.	SK	850
19	20	Whse.	SK	1750
33	20	Whse.	SK	1150
7	20	Whse.	SK	750
2	25	Whse.	SK	1750
19	25	Whse.	SK	1150

Qu.	Hp.	Make	Type	Speed
9	25	Whse.	SK	825
1	30	Whse.	SK	1750
6	30	Whse.	SK	1150
2	30	Whse.	SK	975
2	30	Whse.	SK	850
2	30	Whse.	SK	775
3	40	Whse.	SK	1700
1	40	Whse.	SK	950
5	40	Whse.	SK	775
4	50	Whse.	SK	1700
3	50	Whse.	SK	1150
1	50	Whse.	SK	565
1	60	Whse.	SK	680
2	60	G.E.	RC 132	1700
1	75	G.E.	RC 135	1250
1	75	Whse.	SK	1750
1	75	Whse.	SK	1150
1	75	Whse.	SK	850
1	75	Allis	E-131	1750
2	25	Reliance		1150
1	75	Reliance		850
1	100	G.E.	R.C.	1750
1	100	G.E.	R.C.	1150
1	100	Reliance		1150

TRANSFORMERS

3—1500 kva. G.E. 23000/2300/4000
4— 833 kva. G.E. 11500/2300/4000
3— 500 kva. Packard 22000/11000 220/440
3— 75 kva. G.E. 11000/2300/4000
3— 125 kva. G.E. 4600/2300 230/460
3— 50 kva. WEM 4000/230/460
3— 50 kva. G.E. 2300/115/230
3— 50 kva. G.E. 2300/230/460
3—37½ kva. Pittsburgh 2300/230/460
3— 25 kva. G.E. 2300/230/460
3— 25 kva. G.E. 2300/115/230
2— 50 kva. Packard 2300/230/460

2— 75 kva. WEM 2300/230/460
1— 100 kva. WEM 2300/230/460
3— 15 kva. Pittsburgh 2300/115/230
1— 25 kva. WEM 440/110/220
3— 5 kva. G.E. 440/110/220
2— 7½ kva. WEM 440/110/220
2— 25 kva. Packard 440/110/220
2— 50 kva. G.E. 13200/6600 230/460
1— 10 kva. Wagner 440/110/220
1— 7½ kva. Pitts. 4800/2400 120/240
2— 5 kva. WEM 2300/115/230
1— 1½ kva. WEM 440/110/220

We Maintain the Largest Repair Shop in Northeastern Pennsylvania And Are Equipped to Repair All Classes of Electrical Equipment

OTHER APPARATUS AVAILABLE TO PURCHASERS

Turbine Generators—Synch. Condensers—Air Compressors—Mining Equipment—Frequency Changers—Engine Generators—Arc Welders—Steam Boilers

YOUR SURPLUS EQUIPMENT BOUGHT FOR CASH

PENN ELECTRICAL ENGINEERING CO.
SCRANTON, PA.

AUCTION

We will on Tuesday, April 18, 1939
at 11:00 A.M.
sell at PUBLIC AUCTION
The Machinery and Equipment
formerly belonging to

I. WINKLER CUT STONE COMPANY
2618 to 2626 S. Sacramento Blvd.
Chicago, Illinois

One Bedford 12' rip machine (serial No. 361) with power raising and lowering equipment complete with 60" Diamond Saw Blade and two motors.

One Pollard 10' rip and jointing saw machine (serial No. 222) complete with 48" Diamond Saw Blade and two motors.

One Bedford (serial No. 312) 12' x 3'6" x 3'6"—right hand open side planer complete with Cross and Vertical Tooling attachments and motor.

One New Albany (serial No. 105) 12' x 3' x 3'6" open side planer—complete with countershaft and motor.

One New Albany (serial No. 180) 12' x 3' x 3'6" open side planer—complete with countershaft and motor.

One New Albany (serial No. 190) 12' x 3' x 3'6" open side planer—complete with countershaft and motor.

One Brunner and Lay 8-ton electric derrick—complete with motor.

Miscellaneous — cutting tools, small tools, office equipment, etc.

TO BE SOLD PIECE-MEAL ONLY

INSPECTION APRIL 15th-17th

Descriptive Circulars At Office of

SAMUEL L. WINTERNITZ & CO.
AUCTIONEERS
38 S. Dearborn St. Chicago, Ill.

FOR SALE

CRANES and SHOVELS

2—BUCYRUS ERIE DIESEL SHOVELS. Model 43B, 2 yd. capacity, 55′ or 70′ Crane Boom
1—LINK BELT DRAGLINE GASOLINE, Model K-55, 2 yd. capacity, 85′ Boom
1—KOEHRING SHOVEL, Model 501, Gasoline, 1¼ yd. capacity, 50′ Crane Boom
1—INDUSTRIAL BROWNHOIST CRANE, Gasoline 50′ Crane Boom, Capacity 15-tons
1—BYERS BULLDOG SHOVEL, Gasoline, ½ yd. capacity, 40′ Crane Boom
1—UNIVERSAL TRUCK CRANE, Gas., 28′ Boom

DERRICKS

1—TERRY STEEL STIFF LEG, 87′ Boom, Capacity 60 tons at 40′
1—AMERICAN TERRY STEEL STIFF LEG, 100′ Boom, 10 ton Capacity
6—AMERICAN STEEL GUY DERRICKS, 100′ Booms, 15 ton Capacity

COMPRESSORS

1—INGERSOLL RAND Truck Mounted, 2 stage, 105 cu. ft. Capacity, Gasoline
1—INGERSOLL RAND Portable, 2 stage, 210 cu. ft. Capacity, Gasoline
1—INGERSOLL RAND Portable, 2 stage, 315 cu. ft. Capacity, Gasoline
Also I R Belt Driven Stationary Machines from 1200 to 3000 cu. ft. capacity.

ATLANTIC EQUIPMENT CORP.

50th & Grays Ave. PHILADELPHIA, PA.
Tel. Evergreen 6363

LOCOMOTIVES

100 Ton American 2-8-0 separate tender, 23x28″ cylinders.
80 Ton Baldwin 8-wheel switcher 0-8-0 separate tender, 21x28″ cylinders.
75 Ton Baldwin 6-wheel switcher 0-6-0 separate tender, 21x26″ cylinders.
72 Ton Baldwin 6-wheel switcher 0-6-0 separate tender, 20x26″ cylinders.
60 Ton Baldwin 6-wheel switcher 0-6-0 separate tender, 19x26″ cylinders.
60 Ton Porter 6-wheel switcher 0-6-0 separate tender, 18½x24″ cylinders.
50 Ton Baldwin 6-wheel switcher 0-6-0 separate tender, 17x24″ cylinders.

Complete Stock List on Request

BIRMINGHAM RAIL & LOCOMOTIVE COMPANY
Birmingham Alabama

FOR SALE

Compressor—Sullivan, model 160 two stage, Air Cooled, Gasoline Powered, Portable, Steel Wheel mounted, Actual Capacity 160 cu. ft. per min. 100 lb. pressure, condition excellent.

Locomotive—Vulcan 32 ton standard gauge, 4 wheel saddle tank, 190 lb. code boiler.

Mixer—Smith 56 S Tilting type, 2 cu. yd. capacity concrete mixer like new.

E. E. FORT

1119 S. 56th St. Philadelphia, Pa.

FOR SALE

A complete Hydrate plant, less buildings. This plant was erected in 1931, had a complete overhauling 1937. It consists of a No. 4 Improved Clyde Hydrator for Batch or Continuous operation, capacity 6 to 12 tons per hour. One 14′ Gayco Separator; one 10′ Gayco Separator; one Kuntz Beater Mill with Automatic rejection; one No. 4 Kuntz Cooler Separator; also numerous 9″ to 12″ Screw Conveyors. For quick disposal unusual prices are offered.

Also for removal from site at Campbells Station on siding four miles from New York, 10 (ten) 11′x50′ high Shaft Kilns, most of them lined and ready to operate. Will be sold shells only or shells with lining.

Wire or write

WM. J. KUNTZ

Box 574 York, Pa.

TRUCK MIXERS

(Used and Rebuilt)

1—2½-Yd. Jaeger. Completely rebuilt, A-1 shape. Low price.

2—Rex Chain Belt Moto-Mixers. On trucks. 2½-Yd. Used on one job only.

1—1½-Yd. Moto-Mixer. On Ford truck. Used on two jobs.

5—Rebuilt 3-Yd. Jaeger truck mixers, on trucks (Mack) with truck engine drive. Ready to go to work. About $2,500.

Send replies to

BOX 409
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE

ORTON—gasoline operated, cat mounted crane. 50 ft. boom. New 1929. Price $1250.

CRUSHER—Austin No. 103. Will crush 7 tons per hour down to ¾ inch. Gyratory type.

HOIST—Thomas, slackline. 55 H.P., two drum electric. Will sell with or without motor.

CONVEYOR—Head and Tail pulleys with drive for 24″ and 30″ belt. Ball bearing idlers for 24″ belt. Also one 16″ belt conveyor mounted on 20 ft. steel frame.

CLAMSHELL BUCKETS—Five units ¾ yds. to 2 yds. All rehandling type.

LOCOMOTIVE CRANES—One Gasoline operated and three steam operated.

P. A. HENAULT

2140 Book Bldg. Detroit, Mich.

FOR SALE

Model 00 Raymond pulverizer with 35 H.P. 440 volt motor, air separator or classifier, and tubular air filter. Complete in first class condition.

4½ yard Paige dragline bucket.

MACHINERY SALES CO.

1133 Royal St. New Orleans, La.

SURPLUS EQUIPMENT FOR SALE

1 full revolving crane with electric power and ½ cubic yard clamshell bucket.....$600
1 Sauerman cableway hoist with 9 cubic foot bucket.....$220
1 Monighan two-drum hoist with 2 cubic yard power scraper.....$500
3 Gilbert screens, 54″x 72″, complete, each...$25

CONSOLIDATED SAND & STONE CO.
SIOUX FALLS S. DAKOTA

WANTED

TRACTOR SHOVEL

Hough—Trackson—Leslie or General Equipt. Want tractor & shovel complete immediately.

J. W. BUYERS

200 Woodward Ave. Buffalo, N. Y.

1—24″x36″ Traylor Jaw Crusher.
1—24″x36″ Farrell Jaw Crusher.
1—18″x36″ Farrell Jaw Crusher.
1—10″x36″ Farrell Jaw Crusher.
1—6″x36″ Farrell Jaw Crusher.
1—10″x20″ Farrell Jaw Crusher.
1—16″x36″ Buchanan Jaw Crusher.
1—15″x30″ Reliance Jaw Crusher.
1—40B Telsmith Gyratory Crusher.
1—10A Telsmith Gyratory Crusher.
1—6″ Traylor Gyratory Crusher.
1—12″ Kennedy Gyratory Crusher.
1—No. 19 Kennedy Gyratory Crusher.
1—4′x12′ Triple Deck Kennedy Vibrator Screen.
1—3′x10′ Double Deck Telsmith Vibrator Screen.
1—3′x8′ Double Deck Telsmith Vibrator Screen.
No. 7 and No. 8 Telsmith Sand Tanks.
1—New Triplex Road Pump.

BLUE BALL MACHINE WORKS
Blue Ball, Pa.

BARGAIN COUNTER

P&H No. 600, 60′ boom, No. 3315, used very little for setting steel. 90% NEW. A REAL BARGAIN.
UNIVERSAL TRUCK CRANE, No. 1345, 24′ boom, mounted four speed MACK TRUCK with double outriggers. Three lever operation.
BYERS BEARCAT, No. 3417, 28′ boom. $550.
2—WHITCOMB 24″ ga. 4½ ton, locomotives. $350 each. Nos. 12548-9.
e2—WHITCOMB 24″ Ga. 6 ton locomotives. $350 each.
a8—CP No. 5 DRIFTERS complete with SHELLS and SCREWS. Recon. $125 each.
I. R. 310′ PORTABLE COMPRESSOR, No. 88785, rubber tires, $985.
Large Lot "BOSS" Style W-16 3″ HOSE CLAMPS, COUPLINGS and MEMBERS.
We are always in the market to buy modern equipment for CASH—what do you have to offer.

CHARLES DREIFUS CO.

Widener Bldg. Philadelphia, Pa.
R. H. Boyer, Mgr. Equip. Div.

STOCK EQUIPMENT

1—7′6″ x 100′ **Rotary Kiln.**
2—Sturtevant 4 x 8″ and 5 x 10″ **Jaw Crushers.**
1—Christie 5 x 34″ indirect heat **Rotary Dryer.**
1—Sturtevant 16 x 10″ **Crushing Roll.**
1—Hardinge 24″ x 8″ Conical **Ball Mill.**
1—Williams No. 4 Jumbo **Hammer Mill.**
1—Telsmith 9 x 30″ roller bearing **Jaw Crusher.**
1—Link Belt K-55 **Electric Shovel.**
1—Traylor No. 37TZ **Gyratory Crusher.**
Tyler Hummer and Rotex Screens; Air Separators; Air Compressors; Ring Roll Mills, etc.

This is only a partial list. Send us your inquiries.

BRILL EQUIPMENT CORPORATION

183 Varick Street New York City

FOR SALE

¾-yd. General Combination Crane and Shovel; also following electric motors:
2—75 hp., 3-phase, 60 cycle, 220-440 volt;
1—150 hp. synchronous motor, 220-440 volt;
1—40 hp., 3-phase, 60 cycle, 220-440 volt.

YOURTEE-ROBERTS SAND CO.
Chester Illinois

WANTED

Bids from responsible individuals or firms to produce fifty to one hundred thousand tons agricultural limestone from central Illinois stone deposit. For details write to

CARL SCHWEIKERT

LINCOLN - - - - - ILLINOIS

RAILS "1 Ton or 1000"

NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—25,000 tons—All Sections—All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates.
Buy from One Source—Save Time and Money.
'Phone, Write or Wire.

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

FOR SALE

Valuable Aerial Tramway at a Bargain Price

Trenton-Bleichert Automatic Dump Type. Manufactured by American Steel & Wire Company. 2800 feet long. Locked-coil track cables. 32—1500 pound buckets, capacity 600 tons in 8 hours.
Write or wire for full particulars.

CHESTER A. BUNDY
County Nat'l Bank Bldg.
Punxsutawney Pennsylvania
Telephone 382

FOR SALE

200 Ton Wheel Press, 42″ between bars.
3 L Allis Chalmers Gyratory Crusher—Rear Drive, complete with 30″ Rubber Covered Belt 152′ long, with Steel Buckets 30″x9″x15″.
125 KW Genl. Elect. Chuse 3/60/2300.
150 KW Engine Generator Set 3/60/240.
Mammoth 42″ Allis-Chalmers Gyratory Crushers.

ARTHUR S. PARTRIDGE

415 Pine St. St. Louis, Mo.

Lorain 1¼ yd. gas crawler shovel. Bargain price.
Bucyrus Cl. 24 Diesel-Electric drag., 115′ boom.
B-E ½ yd. Gas Shovel, Model 1020. Modern and A-1.
⅜ yd. shovel, pneu. tires; ⅜-½ yd. on cats.
P&H 200-A ⅜ yd. crane-drag. Byers ½ yd. crane.
Barber-Greene Loaders No. 21 to No. 82. Also Haiss.
Sauerman Eqpmt.—Hoists, Buckets, etc., 1/3 to 4 yd.
Portable crushing & screening plants, 18x24 crusher.
Buckets—Prac. full line, Inc. Brownhoist 1½ yd. @ $350, Kiesler ⅝ yd. @ $175, & Page ⅜ yd., $175.
PUMPS—Sand & Gravel, 8″-10″, etc. Swintek 38′.

James Wood, 53 West Jackson Blvd., Chicago, Ill.

"E. C. A. Rebuilt" Quarry and Gravel Plant Equipment

AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 21 cu. ft. to 1,000 cu. ft.

BINS

1—150 ton Blaw Knox 3-compart. with scales, 10,000 lbs. cap.
7—2-compartment: 1—167 ton Butler; 1—118 ton Blaw Knox; 1—69 ton Johnson; 1—60 ton Butler; 2—35 ton Blaw Knox; 1—26 ton Heltzel. With or without weigh batchers.
1—1,200 bbl. Blaw Knox round bulk cement bin with 2,000 lbs. weigh batcher.
1—275 bbl. Johnson port. bulk cement plant with 1,000 lbs. weigh batcher, bucket elevator and car unloader.

BUCKETS

1—4 yd. class G Hayward clamshell.
35—Williams, Blaw Knox & Owen clamshell, all sizes & types.
7—Dragline: 1—1¾ yd. Northwest; 1—1½ yd. Omaha; 5—Page; 1—1½ yd. class C; 2—1¼ yd. class C; 1—1 yd. class M; 1—¾ yd. class C.
3—Dragscraper: 1—1 yd. Sauerman LeClair; 1—1 yd. Green; 1—½ yd. Green.

CRANES, DRAGLINES & SHOVELS

1—Link Belt K-55 ser. No. 1698, 70′ boom, 2 yd. bucket; also have 2 yd. shovel attachment.
1—Lorain 77-D, ser. No. 5682 (new 1938) powered by Caterpillar mod. 13,000 Diesel engine, 60′ boom, 1¼ yd. Kiesler clamshell bucket.
1—P & H mod. 650, ser. No. 4188, 65′ box type boom, 1¼ yd. bucket.
2—Northwest mod. 104, ser. Nos. 2079 & 1597, 45′ boom, 1¼ yd. bucket; one with 1 yd. shovel attachment.
1—Link Belt K-42, ser. No. 1265, 45′ boom, 1¼ yd. bucket; also have 1 yd. trench hoe attachment or 1¼ yd. shovel front.
2—Northwest mod. 105, ser. Nos. 2053 & 1522, 40′ boom, 1 yd. bucket.
1—Link Belt K-1, ser. No. 1024, 50′ boom 1 yd. bucket.
2—Osgood Heavy Duty, ser. Nos. 2069 & 2087, 40′ boom, 1 yd. bucket & one with 1 yd. shovel attachment.
1—Bucyrus Erie Model 1030, ser. #10512, comb. crane with 48′ boom & ¾ yd. shovel front.
1—P&H model 206 with 42′ boom & ¾ yd. bucket.
1—Erie type B combination ¾ yd. shovel & crane, ser. No. 3109, 40′ boom.
1—Universal mod. 35, ser. No. 1200, 56′ boom, ½ yd. bucket.

CRANES (Gasoline Locomotive)

1—12 ton Brownhoist gas crane No. 2, ser. No. 8881, 8 wheel, 40′ boom.

CRUSHERS

4—Gyratory: 1—#20 Kennedy; 1—Wesston 36-B fine reduction type with 50 HP motor. Cap. 90 TPH of 1″ mat. 1—#3 McCully; 1—#0 McCully.
3—Jaw crushers: 1—14″ x 36″ Cedar Rapids; 1—10x20″ Climax No. 2½; 1—9x16″ Telsmith No. 98.
1—Set of Allis Chalmers smooth type crushing rolls, 42x16″.

DERRICKS

4—Steel stiff leg: 1—15 ton Clyde, 50′ boom; 1—15 ton Clyde "A" frame barge derrick, 50′ boom; 1—10 ton Insley, 80′ boo.n; 1—5 ton Insley, 80′ boom.
6—Steel guy derricks: 1—15 ton Terry, 115′ mast, 100′ boom; 1—10 ton American, 115′ mast, 100′ boom; 3—6 ton Bedford, 90′ mast, 80′ boom; 1—5 ton Dobbie, 70′ mast, 58′ boom.

WHIRLEY

1—Mod. 75 Wiley Whirley No. 2973, 20 tons cap., 75′ boom, SD Clyde 80 HP elec. hoist & 30 HP elec. swinger, all complete. Perfect condition.

Send for Complete New Stock List

EQUIPMENT CORPORATION OF AMERICA

PHILADELPHIA	CHICAGO	PITTSBURGH
P. O. BOX 5471, KINGESSING STA.	1160 S. WASHTENAW AVE.	P. O. BOX 933
PHONE GRANITE 7600	PHONE NEVADA 2400	PHONE FEDERAL 2000

RAILS "1 Ton or 1000"

NEW RAILS—5000 tons—All Sections—All Sizes.
RELAYING RAILS—25,000 tons—All Sections—All Sizes, practically as good as New.
ACCESSORIES—Every Track Accessory carried in stock—Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates, Hydraulic Wheel Presses.
Buy from One Source—Save Time and Money. 'Phone, Write or Wire.

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

WANTED

Concrete Products Plant Manager capable of building small sand and gravel plant and assuming complete charge of production, sales and management. Investment $5,000 required. Write

CONCRETE PRODUCTS CO.
700 North 7th Avenue
Tucson - - - - - - - - - Arizona

WANTED

150 troughing idlers—20″
70 return idlers
Roller or ball bearing.

CAMPBELL LIMESTONE CO.
Gaffney South Carolina

FOR SALE—CHEAP

Bucyrus Erie Caterpillar Steam Shovel, ¾ yard dipper, also have 40 ft. boom attachment for use as crane.

S. C. WEBER IRON & METAL CO.
720 E. Main St.
Chattanooga, Tennessee

AIR COMPRESSORS
ALL TYPES
BELT & MOTOR DRIVEN
LARGE OR SMALL
Send for Special Bulletin
THE O'BRIEN MACHINERY CO.
113 N. THIRD ST., PHILADELPHIA, PA.

FOR SALE

100-B Bucyrus Erie Electric Shovel, 2300 Volt, Ward Lenard control, new 1927, excellent operating condition, 3 cu. yd. dipper.
Address
Box 306
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE

Newaouse Crusher Sale No. 8535, 10″, 100 H.P. Motor, 2200 volt, non-choking manganese concaves, new type ball and socket spider arrangement.
Send inquiries to
BOX 403
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

CONTRACTORS' EQUIPMENT

25 ALL-STEEL ROCK CARS

Length 29′, Width 8′, Cast Steel Trucks
CUBICAL CAPACITY, 1160 CU. FT. LOW PRICED
Especially suitable for ballast loading or contracting work

70 WESTERN DUMP CARS

12 CUBIC YARD CAPACITY
19′ length, 9′ width, 22½″ sides
PRICED FOR IMMEDIATE SALE

25—40-ton steel u/f flats
20—50-ton steel u/f flats
200—30-ton steel u/f box cars
25—50-ton all steel gons.
25—30-ton steel gondolas, St. Ga. Blt. 1926
Used and Tested Freight Car Replacement Parts
Locomotive Cranes—Saddle Tank Locomotives

RAILS

Complete Stocks of 90 lb., 85 lb., 75 lb., 70 lb., 65 lb., 60 lb. and lighter weights, complete with angle bars, carried at principal points throughout the country, available for rail or water shipment.

HYMAN-MICHAELS COMPANY
122 South Michigan Ave. Chicago, Illinois
St. Louis • New York • San Francisco • Seattle

Jaw Crushers—4″x8″ up to 66″x84″.
Crushing Rolls—16″x10″ up to 54″x24″—Gyratory Crushers
Ring Roll Mills—No. 0 and No. 1.
Swing Hammer Mill.
Rotary Fine Crushers—No. 1, No. 0.
Direct Heat Rotary Dryers—3½′x25′, 4′x30′, 5′x30′, 5½′x40′, 6′x50′, 7′x50′ and 8′x50′.
Semi-Indirect heat Dryers—4′x30′, 4½′x26′, 5′x30′ and 8½′x75′.
Cement Kilns—3′ up to 8′ diameter.
Hardinge—Marcy & Fuller-Lehigh Mills.
Raymond Mills—No. 00, No. 0 and No. 1 and No. 5 roll
Tube—Rod and Ball Mills—3′ to 8′ diameter.
Vibrating Screens—Air Separators.
1—4′x4′ Ball Mill.
New Dryers built for all purposes.

W. P. HEINEKEN
95 Liberty St., N. Y. Tel.: Barclay 7-7298

FOR SALE

10″ H. & B. Manganese Sand Pump, 400 H.P. A. C. Motor.
20 Tram Cars, 2 yard 36″ ga.

WYLIE-STEWART MACHINERY CO.
Oklahoma City, Okla.

CONCRETE—CEMENT—PLANTS

Johnson concrete plant, 100 yds., complete with bulk cement bin, conveyor, weigh batchers. New 1937.
250 bbls. Blaw Knox cement bin, elevator, screw conveyor, weigh batchers, etc., complete plant.
155 bbls. Fuller cement bin, electric weigh batchers.
110 tons Blaw Knox, steel, 2 compts., weigh batchers.
300 bbls. Heltzel cement bin, screw conveyor, elevator.
2 Smith 1 yd. concrete mixers, skid mounted, water tank, hopper and tell tale, electric motor driven.
1 Fuller Kinyon Type B portable cement loader.
1 Fuller Kinyon rotary air compressor.

CRUSHERS—JAW—CONE—GYRATORY

Jaw—6x12, 9x16, 10x20, 12x26, 13x30, 18x36, 24x36, 42x60.
Gyratory—Gates K, Nos. 4, 5, 6, 7½D, Kennedy, Van Saun, Nos. 30, 37, 37S, 49, McCully Nos. 5, 6, McCully Superior 8″.

CRANES—SHOVELS—DRAGLINES

1 Clyde Whirley, 25 tons cap., 105′ boom, oil fired steam.
1 Browning, electric loco. crane, 15 tons, 45′ boom.
1 Marion electric shovel-crane, 1¼ yds., caterpillar.
1 Lima, gas, caterpillar, 1¼ yd. crane-dragline.
1 Lorain, gas, caterpillar shovel, 75B—1½ yds.

CLAM SHELL—ORANGE PEEL BUCKETS

1—Williams Hercules 1½ yd. digging clamshell, NEW.
1—Owen ½ yd. clamshell digging bucket, type M.

CONVEYOR EQUIPMENT

Jeffrey 30″ conveyor, 400′ centers, steel frame, complete. Motor 50 h.p., roller bearing rollers.
Barber Greene conveyors, 24″, steel frames.
Electric drive, 35′ to 45′ type N.
Belt conveyors, complete, steel frames, belt and motors, 24″, lengths, 45′ to 200′.
Conveyor belt, 18″, 20″, 24″, 36″.
Head & Tail pulleys, take-ups, rollers, idlers.

MISCELLANEOUS

5—Mack Model AB dump trucks, pneumatic.
Dredge pumps, 6″, 8″, 10″, 12″, 16″.
Gas locomotives, 2½ to 35 tons.
V type, side dump steel cars, 2 & 3 yds., 36″ ga.
2—Sauerman Crescent ¾ yd. dragline buckets.
Derrick, Clyde steel stiff leg, 80′ boom, 10 tons.
Clyde 3 drum & attached swinger, electric hoist, 75 hp.
1—3′x6′ vibrating screen, 3 decks, Kennedy Van Saun.
1—3′x6′ vibrating screen, single deck, Kennedy Van Saun.

Richard P. Walsh Co., 30 Church Street, New York, N.Y.

MACHINERY NEW USED

Everything for the

PIT OR QUARRY

Send us your inquiries.

ROSS POWER EQUIPMENT CO.
INDIANAPOLIS, INDIANA

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.
FORT WAYNE, IND.

Royal E. Burnham

Attorney at Law

•

Patent and Trade-Mark Causes

•

511 Eleventh Street, N. W.
WASHINGTON, D. C.

FOR SALE---A Good Time to Buy

Quarry cars S/G 5 & 8 yd. steel.
Shovels 100B-88C electric and steam on cats.
Dredge 15" complete electric Michigan.
Ball mills Marcy 10x9 Hardinge 8x22".
Crushers Gyr. 42"—No. 37—No. 19-8L—7½-4.
Locos. 36" ga. 8-12-20 ton S/G 27 ton.
Crushers Jaw 60x84—30x42—rolls 42x15.
Shovels M. 70-B 37E—P&H 900—all on cats.
Draglines 6W-el. 24-175B-Page 420-el. diesel.

A. V. KONSBERG, 111 W. Jackson Blvd., Chicago, Ill.

FOR SALE—Excellent used Truck Mixers.

REAL BUYS—With or without trucks.

Send replies to

BOX 318

PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

WE LOOK INTO THE EARTH

By using Diamond Core Drills We drill for Limestone, Gypsum, Talc. Fire Clay. Coal, and all other minerals.

PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

RELAYING RAILS

All sections new and relaying rail, spikes, bolts, frogs, switches, "V" Shaped, flat and Contractors' Cars, etc. Prices cheerfully quoted.

M. K. FRANK
480 Lexington Ave., NEW YORK CITY
25 St. Nicholas Bldg., PITTSBURGH, PENNA.

No. 19 & No. 37 Kennedy Fine Reduc. Gyr. Crushers.
NEW 2000 watt Gas Light Plant 110-25V DC.
6, 8, 10, & 12" Sand and Gravel Pumps.
Conveyor Equipment 14 to 36" Belt and Portable.
25 ton std. Ga. Davenport Saddle Tank Locomotive.
120 HP Fairbanks-Morse type Y style V Diesel.
75B Lorain Comb. Shovel Crane—Excellent.
1½ yd. Page type C Dragline Bucket—Bargain.
Vibrating and Rotary Screens, all types, sizes.
20—1½ yd. 30" ga. Day Evans all-steel Dump Cars.
½ yd. Owen Clamshell. Ask for Bulletin No. 45.

MID-CONTINENT EQUIPMENT CO.
710 Eastgate Pa. 2290 St. Louis, Mo.

3—50 HP. electric shaft hoists.
⅜ yd. Byers shovel.
½ yd. Byers comb. shovel-crane.
Owen & Williams ⅜ and 1 yd. buckets.
Compressors: 110, 275, 310, 446 CF.
Barnes pumps S.P. 3, 4, 6 gas & elec.
Worthington 3" pump elec. 75 ft. head.

J. T. WALSH
Brisbane Bldg. Buffalo, N. Y.

FOR SALE

Koehring ¾ yd. crane; good cond.; low price.
Bay City ½ yd. Dragline; rebuilt.
25-ft. portable conveyor; gasoline power
Sullivan 260 ft. compressor; rebuilt.
Int. T-40 with bulldozer; like new.
40 ft. crane or dragline boom; bargain.

TRACTOR & EQUIPMENT CO.
433 S. Jefferson St., Chicago, Ill.
Branch: 2272 S. 7th, Springfield, Ill.

O. C. HOFFMAN, Pres. L. H. HOFFMAN, Treas.

DIAMOND CORE DRILLING

HOFFMAN BROS. DRILLING COMPANY
PUNXSUTAWNEY, PA.

We drill for any mineral. We have more than forty steam, electric and gasoline drills, adapted for any job. Satisfactory cores guaranteed. Our prices are right.
Established 1902 - - - - - Telephone No. 382

RECONDITIONED

PULLEYS

BELTING, PIPE, ETC.

E. COHN & SONS, INC.
CEDAR RAPIDS, IOWA

Diamond portable crushing plant, nearly new, diesel powered, capacity up to 500 tons per day, for sale or will consider renting on tonnage basis.

ANDERSON EQUIPMENT CO.
Penn Ave. at Water St., Pittsburgh, Pa.

PIONEER PORTABLE WASHING PLANT

300-W wheel type, sand & gravel crushing, screening, washing, stockpiling plant, complete with 4 conveyors, gasoline motors, pump, pipe, etc. Good condition, cap. 75 to 100 yds. per hr. Central West; reasonable.

H. Y. SMITH CO.
828 N. Broadway Milwaukee, Wis.

FOR SALE

52—8-Yd. Phoenix type quarry cars, 4' 8½" gauge, (std.) heavy axles, good condition, have been used on tipple dump, ¾" size MCB couplers.
15—8-Yd. Side dump cars, std. gauge, wood bodies, steel under frame.

Address

Box 303
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE

100 Ton Fairbanks R.R. Scale.
8A Telsmith Crusher.
2 Toepfer Screw Type Washers.
2 Centrifugal Pumps with 30 H.P. Mtr.
2 Speed Reducers.
2—40"x17' Tels. Gravel Washers.
Various Size Motors.

CHICAGO FIRE BRICK CO.
1467 Elston Ave. Chicago, Illinois

100000 ITEMS

- Motors
- Generators
- Transformers
- M G Sets

Wire—Write—Phone

ERIE ELECTRIC MOTOR REPAIR CO., INC.
124 Church St. Buffalo, N. Y.

SEND US YOUR INQUIRIES

140 HP Fairbanks Morse "32" Diesel with Clutch.
45 ton Plymouth Gas-Elec. Locomotive. New 1932.
20 ton Whitcomb std. gauge Gasoline Locomotive.
2—Buda 100/150 HP 6 cyl. Gasoline-Oil Engines.
40 HP Fairbanks Morse "VA" Diesel. Belt drive.
No. 8-L Gates Primary Gyratory Crusher. Modern.
50-B Bucyrus 2 yd. Steam Shovel. New 1929.
No. 3 Northwest ¾ yd. Shovel & Dragline. Rebuilt.

MISSISSIPPI VALLEY EQUIPMENT CO.
501 Locust St. St. Louis, Mo.

SAVE

Bolted type steel bins will cost you less erected than ordinary wood bins.

New and Used Pipe and Tubing

Jos. Greenspon's Son Pipe Corp.
Natl. Stock Yds. (St. Clair Co.) Ill.

1—Bucyrus-Erie GA-2 1¼ gas air shovel serial 4366, $2750.00. Located our yard, Baltimore.

D. C. ELPHINSTONE, INC.
115 S. Calvert St., Baltimore, Md.

FOR SALE

The Foote "Hammered" Concrete Stripper Block Machine and the Lackey Sewer Catch-basin and Manhole Block Machines can be now seen in operation at the Blue Island Concrete Block Co.'s Plant at 2727 Orchard St. (12400 south and B. & O. C. T. R. R., ½ mile west of Western Ave.), Blue Island, Ills. Phone Blue Island 2842.

District Representatives.
H. A. Lackey, 858 East 39th St., Chicago, Ills.
Phone Drexel 1414.
E. Hanify, 2724 Cochran St., Blue Island, Ills.
Phone Blue Island 348.
C. A. Batt, 159th & Spaulding Ave., Harvey, Ills.

AIR SEPARATORS FOR SALE AT BARGAIN PRICES

1—New 14' Gayco with V-Belt Drive.
1—Slightly used 8' Gayco with V-Belt Drive.
Send replies to

BOX 412
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE

3—General Electric, Gasoline engine Generating Sets, 25 K.W. 115 Volts, D. C. direct connected to 43-54 H.P. General Electric Gasoline Engine 560 RPM.

BURTON MACHINE CO., Inc.
401-3 Chestnut Street, Norfolk, Virginia

AVAILABLE

Cost conscious production ability you can use at a profit. 18 Years' seasoned experience in Non-Metallic Mineral and Chemical Processing industries.—Business and Engineering training.—Has planned and executed all details of Plant Management—Maintenance—Personnel Relations.—Knows how to carry your objectives to completion.—Married—42 years old.—Employed, but available for an interview—or will send additional facts by mail. Prefers South, but will go anywhere.

Send replies to BOX 406
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE

2—Link-Belt dewatering elevators, 36' centers, complete with all steel supporting structures and drive machinery.
2—Strut bar, revolving scalping screens, 48" diameter, 12' long, with drive machinery.
1—Sauerman, 2 cu. yd. capacity, slackline, electric hoist with 150 H.P. motor and starting equipment.

TERRE HAUTE GRAVEL COMPANY
Terre Haute Indiana

FOR SALE

1—30 Ton Saddle Tank Vulcan Locomotive, Standard Gauge.
8—10 yard Bellwood Side Dump Cars, Standard Gauge.
1—150 HP 25 Cycle Motor & Starter.
1—Worthington axfio Deep well Pump (never used).
3—75 K.V.A. Westinghouse Transformers.

CARROLL SAND & GRAVEL CORP.
488 Ellicott Square Buffalo, N. Y.

CLOSING OUT BARGAINS

10x36 Gruendler Roller Bearing Jaw Crusher.
3 deck 3'x8' Jigger, 3 deck 3'x6' Deister Plato Vibrating Screens.
Sauerman 1¼ yd. dragscraper outfit with Williamette-Ersted two-speed hoist—roller bearing—mounted on Caterpillar tractor.
4'x16' A-C Revolving Screen with dust jacket.
½ yd. Insley full revolving shovel type R.
1½ yd. 37-B Bucyrus-Erie combination shovel-dragline. Cost new $20,000. Sell $4000.

M. WENZEL
2136 Jefferson St. Kansas City, Mo.

FOR SALE

Rotary kiln, new, 6'x20' with 30"x30' stack and front housing. 7/16" shell, 5" tires, standard carrying and driving mechanisms. Price f.o.b. Franklin, $900.

MINERALS, Inc.
Franklin North Carolina

WANTED

There is a particularly good opening for salesman type of manager of a sand and gravel property in Texas. Please send qualifications and experience.

Address all replies to
Box 415,
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

EQUIPMENT FOR SALE CHEAP

1—Vulcan 40 ton Std. Ga. Saddle tank locomotive.
1—Marion 1 yd. Steam crane 40′ boom on cats.
1—Russell Grader, 10′ Blade.
1—Link-Belt K-30 Trench Hoe, 45′ Boom.
1—Link-Belt K-44 shovel 50′ boom, fairleads.
1—Lorain 75 B 1¼ yd. chain crowd shovel.
2—Whitcomb 12 Ton 36″ Gauge Locomotives.
2—C. P. Compressors, 500 cu. ft., 100 h.p. motor.
2—Worthington Compressors, 621 cu. ft., 75 h.p. mtr.
1—Monarch 75 Caterpillar with bulldozer.
1—Sullivan 310′ portable compressor.
1—Ingersoll-Rand pavement breaker.
6—Easton 4 yd. all steel 36″ Ga. cars.
4000′ of 9″ x 9″ road forms.
1—Ransome 27 E Paver.
2—No. 116 Chicago Pneumatic Paving Breakers.
2—1 yd. Insley bottom dump concrete buckets.
1—Schramm No. 120 Compressor.
1—1 yd. Owen Bucket.
1—1 yd. Kiesler rehandling bucket.
1—¾ yd. Browning clamshell bucket.
1—¾ yd. Blaw-Knox bucket.
1—Le Courtney 6″ Cent. Pump, 40 h.p. motors.
1—Morris 8″ dredge pump, 150 h.p. G.E. motor.
1—Morris 10″ cent. pump, 2250 GPM at 130′ head.
1—Goulds 12″ cent. pump, 50 h.p. G.E. motor.
1—Thompson 6″ self-priming pump, Waukesha motor.
2—Gardner Denver Sheeting Hammers.
2—Humdinger 6″ self-priming pumps, gas motor.
1—Humdinger 4″ self-priming pump.
1—Humdinger 2″ self-priming pump.
1—Domestic double diaphragm pump, gas motor.
1—G.E. motor, 200 h.p. slipring.
2—No. 9 B 2 McKiernan-Terry Hammers.
3—No. 5 McKiernan-Terry Hammers.
3—No. 7 McKiernan-Terry Hammers.

HARRY C. LEWIS

325 Frelinghuysen Avenue — Newark, N. J.

Selected Modern Equipment

18″ Robins Belt Conveyors, 260′ & 125′.
4—24″ Belt Conveyors, 100′ and 150′ c.
24″ Weller Automatic Belt Tripper. New.
30″ L-B Package Conveyor, 32 ft. Frame.
All Sizes Belt, Idlers, Pulleys, Drives.
3 x 6 Leahy 2-deck Vib. Screen, Motor-drive.
4 x 8 Huron 3-d. Vib. Screen, 7½-hp. motor.
Telsmith Rotary Grizzly, Size 30. New.
24x13 and 36x15 Farrel type B Crushers.
Telsmith 6-B Primary Gyratory Crusher.
Traylor "Bulldog" Gyratory 8″ Crusher.
Jeffrey 15′ x 8″ Swing Hammer Mill.
Sturtevant No. 1 Ring Roll Mill.
Centrifugal Elect. Water Pumps, All Sizes.
800-hp. Kelley Feed Water Heating System.
6-Ton Brownhoist Overhead Crane, 20′ span.
Worthington Duplex Air Compressor, 660′.
20 & 40-ph. Double-Drum Gasoline Hoists.
60-hp. 1-drum Mine Hoist, Variable Speed.
1¼-yd. Marion Electric Shovel, on Cats.
Bucyrus-Erie ¾ Steam Shovel Front.
Cletrac Tractor, On Cats., 40-hp. Engine.
½-yd. Sauerman Crescent Dragline Buckets.
2 LeClair 1-yd. Dragline Buckets, open.
700′ of 5″ and 8″ Belt-Bucket Elevators.
300′ of 6″ Manganese Pintle Elev. Chain.
16″ x 50′ & 14″ x 32′ Vert. Bucket Elevators.
10″ x 34′ Encased Vertical Bucket Elevator.

G. A. UNVERZAGT,
15 Park Row — New York City
Warehouse, 136 Colt St., Irvington, N. J.

FOR SALE

2—Telsmith Sand tanks No. 7.
1—15 cu. ft. Hayward Orange peel bucket.
1—6 cylinder 120 H.P. Twin City power plant.
1—110 H.P. Case steam tractor.
1—Locomotive, cars, rails 36″ gauge steam outfit.
1—40-60 Twin City tractor.
1—40 ft. 4 post 6x6 angle steel tower.
1—8 cylinder 55 H.P. 7¾x9 Twin City power plant.
1—2 cylinder 55 H.P. Gade engine.
Pile Hammer—drop type.
Phoenix 10x12 self contained steam engine.
Frost 12x14 self contained steam engine.
American stiff-leg derrick.

EMPIRE SAND AND MATERIAL CO.
Marshalltown — Iowa

SHOVELS—TRUCK CRANES

1—Lorain-77 Diesel Shovel 1½ yd.
1—Lorain 75-B Gas Shovel 1¼ yd.
1—Lorain 75-B Gas Backhoe No. 4278.
1—Northwest No. 4 Gas Crane 50′ Bm.
1—Lorain-40 Truck-Crane 25′ Bm.
1—Universal Truck-Crane No. 1400.
1—10″ Morris Suction Dredge.

GREY STEEL PRODUCTS CO., INC.
74 Central Ave., Glen Rock, N. J.
Tel. Ridgewood 6-2275

STANHOPE OFFERS!

AIR COMPRESSORS
BELTED: 355, 528, 676, 1000, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1302, 1722 & 2850 Ft.
DIESEL: 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.
STEAM: 49, 310, 528 & 1300 Ft.

CLAMSHELL BUCKETS
¾ Yd. Hayward Class E
2 Yd. OWEN Type S Material Handling
1½ Yd., 1 Yd. & ¾ Yd. HAYWARD Class E

CRANES & DRAGLINES
5 Ton Brawhoist, 30 ft. Boom Gas.
12 Ton NORTHWEST 50 Ft. Boom Gas
12 Ton KOEHRING 45 Ft. Boom Gas
16 Ton Speedcrane, Gas, 50 ft. Boom
25 Ton BROWNING & 30 Ton AMERICAN Locomotive
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom

CATERPILLAR SHOVELS
⅜ Yd. BYERS Electric
¾ Yd. KOEHRING Gasoline
¾ Yd. 1¼ Yd., 2 Yd., 4 Yd. & 8 Yd. MARION Electrics
1 Yd. NORTHWEST Gas & 7/8B2 Steamer
1½ Yd. BUCYRUS 41B Steamer

DUMP CARS
46—KOPPEL 1½ Yd., 24 & 30 In. Ga., V Shaped
15—2 Yd., 3 Yd., 4 Yd., 36 In. Ga.,
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

BALL, ROD AND TUBE MILLS
6x8 Continuous Pebble Mill
5x5 Batch Mill
5′x22″ HARDINGE CONICAL Dry Ball Mill
3′x36″ HARDINGE CONICAL Wet Ball Mill
3′x8″ HARDINGE CONICAL Dry Ball Mill
6′x22″ HARDINGE CONICAL Pebble Mill
8′x22″ HARDINGE CONICAL Ball or Pebble Mill
4x8, 8x6, & 10x9 Straight Rail Mills
4x16, 5x18, & 5x22 Tube Mills
3½x8 & 5x7 Air Swept Tube Mills
2x4¼, 3x10 & 5x12 ROD MILLS

PULVERIZERS
JEFFERY 24x20 B & 21½ Sturtevant Ring Roll
RAYMOND Auto. Pulverizer No. 0000, 0 & 3
RAYMOND Imp Mills No. 4, 32 & 55
GRUFENDLER XXB Mill & Jay Bee No. 3 & 4
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill

SEPARATORS AND COLLECTORS
14 ft., 8 ft. and 12 ft. Separators
Type 360 Sly 8x24, 8x52 and 16x42 Dust Collectors

ROLL CRUSHERS
36x60 Fairmount & 36x16 Allis Chalmers
24x12 Power & Mng. Smooth Roll

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36
12x26 Champion. Screen & Elevator

CONE & GYRATORY CRUSHERS
18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
4—10 TZ Traylor 4 ft. Gyratory
4—Nos. 5, 3 & 6 Austin Gyratory
2—Traylor T-12 Bulldog Gyratory
8 in. Traylor T. Gyratory
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½
10 Inch Austin Model 105
10 & 13 Inch Superior McCullus
KENNEDY: Nos. 19, 27, 39 & 49
Telsmith No. 9

HAMMER MILLS
Pennsylvania Trojan M-1.
4 Jeffreys: 24x18-A, 36x24-B, 42x36-E & 42x48-B.
Williams No. 1 Jumbo Jr., & No. 6 Universal.
Gruendler No. 6 X.
Dixie Mogul No. 5040.

HOISTING ENGINES
7 Gasoline 15, 40, 60 & 100 H.P.
17 Steam 7x10, 8½x10 and 10x12
8 Electric 20, 35, 50, 60, 100 & 150 H.P.

DRILLS
4—SANDERSONS 14 & LOOMIS 44
7—Ingersoll-Rand Wagon Drills

STEEL BINS
72 Ton BLAW-KNOX 2 Compt.; also 250 ton
100 Ton BLAW-KNOX 2 Compt.

CEMENT BIN
400 BBl. Portable BUTLER Bulk Cement Bin with Fuller Full Automatic Electric Push Button Weigh Batcher

BUCKET ELEVATORS
7 Steel Encased Chain & Belt Elevators: 15 In. by 60 ft., 24 In. by 63 ft., 18 In. by 48 ft., 12 In. by 30 ft.
ELEVATOR BELT: 600 Ft., 30 In.—1326 Ft. 20 In. & 18 In.

RUBBER HOSE
Air: ¼ in. to 1½ in. Water: ¾ in. to 10 in.

CONVEYOR PARTS
BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
IDLERS: 36 In., 30 In., 24 In., 20 In., 18 In.
Head & Tail—Pulleys—Takeup for all sizes
Steel Frames: 2,000 ft. 24 In., 30 In. & 36 In. Sections

ROTARY DRYERS AND KILNS
36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom

LOCOMOTIVES
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton

SCREENS
VIBRATING: 2x4, 3x6, 2x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72. HUMMER, ROTEX, NIAGARA & ROBINS
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x30, 5x20, 6x20

SAND WASHERS AND CLASSIFIERS
4 LINK-BELT A-60 In. Classifiers.
7 ALLEN Cones 4 Ft., 5 Ft., 6 Ft., 8 Ft. TELSMITH 13 Ft. by 2 Ft. 8 In. Screw Washer.

RAILROAD CARS
12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

SAUERMAN DRAG AND SLACKLINES
1—¾ yd. Gas — 1—1¼ yd. Electric
1—1 yd. Electric — 3—2 yd., 3 yd. & 4 yd. Electric

R. C. STANHOPE, INC.
(Cable Address: "STANEQUIP" New York)
675 6TH AVENUE, NEW YORK, N. Y.
Pennsylvania 6-3565 or 6-3566

REBUILT CONTRACTOR'S EQUIPMENT

Double Drum Hoist
1—Lambert with attached swinger and 60 H.P. G.E. electric motor, $1000.00.
1—Lidgerwood with attached swinger and 80 H.P. G.E. electric motor, $1100.00.
1—Lidgerwood with 80 H.P. G.E. electric motor, $900.00.
1—National with 86 H.P. Buda gasoline engine, $1500.00.

High Speed Builder's Hoists
1—Lidgerwood with 40 H.P. electric motor, $550.00.
1—Lambert with 65 H.P. gasoline engine, $700.00.

1—3 drum Lambert with 80 H.P. G.E. motor, $1200.00.
3—20 ton American Terry No. 3 Guy Derricks, 90′ mast, 80′ boom complete with guys and fittings, $1500.00 each.
1—electric 400′ Sullivan model WJ-3 two stage angle compound compressor, skid mounted, $1500.00.

UNITED HOISTING CO., Inc.
Serving the Construction Industry for 46 Years
175 Locust Avenue, New York, N. Y.
MELROSE 5-2100

Rebuilt Equipment

MARION Model 32 1½ yard Steam Shovel, 27′ Boom; 17′ Sticks.
McMYLER 35-ton Type J Locomotive Crane; 50′ Boom; Air Brakes; Double Drums.
AMERICAN 40 ton 4 Wheel Saddle Tank Type Locomotive.
P&H model 150—½ yard shovel.
P&H model 206—¾ yard crane.
BROWNING ½ Yard Truck Crane.
BROWNHOIST 40 ton Locomotive crane.
VULCAN 8 ton Std. Ga. gas locomotive.
PLYMOUTH 20 ton gasoline locomotive.
BALDWIN 58 ton 6 wheel switcher, 12x24″ cyl. Walscheart valve gear.
WESTERN 12 yard hand dump cars.
WESTERN 6 yard hand dump cars.
WILLIAMS ¾ yd. Hercules clam-shell.
NORDBERG model S track shifters.

Write for Complete List

SOUTHERN IRON & EQUIPMENT COMPANY

Plant & General Offices

Atlanta, Georgia

CRUSHERS

GYRATORY: 42″ McCully with 80% brand new parts. 36″ Allis-C. 20″ Super. McCully conv. to 16″. Gates Nos. 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.

JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 24x36 & 18x36. P&M 24x36. Good Roads 1030 & 1040. Cedar Rapids and others 15x36, 13x36, 9x36, 9x20, 9x15, Etc.

REDUC. TYPE: Kennedy No. 19, No. 25 & No. 37. Tels. 40. Traylor 8″, 10″ & 12″ Model 37TJ & Type T. Super. McCully 6″ & 10″. Newhouse 5, 7 & 10″. Symons 2′, 3′ & 4′ Cone & 36″ & 48″ Disc Ty.

ROLLS: Allis-C. 12½x12″, 36x16, 40x15, 54x24 & 72x30. Cornish 36x56. Fairmount 36x60 and Jeffrey 24x24 to 36x54 Single Roll Crushers.

HAMMERMILLS: Williams Nos. 1, 2, 3, 4, 8 & 9. Jeffrey 36x18 & 36x42. American 13-A, Ty. F. 9″ Sturtevant, Dixie Jr. and many others.

MILLS: Kennedy Ball 4x6, 5x6 & 5x8. Marcy 8x6. Hardinge 3′x3′, 8′x30″, 6′x9′. Misc. Tube Mills 5′ & 6′ x 22′. Sturtevant Ring Roll, Raymonds, Kents, Fuller-Lehigh, Etc., Etc.

CRUSHING PLANTS: No. 65 Diamond, 9x20 & 9x36 C.R.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryers, Derricks, Draglines, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kilns, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices.

(I have equipment at many points in the United States and Canada. What you need may be near your plant.)

ALEX T. McLEOD
7229 Rogers Avenue — CHICAGO

Owen Buckets
OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAYS WORK
A TYPE FOR EVERY DIGGING OR HANDLING NEED & A MOUTHFUL AT EVERY BITE

Get the Owen Catalog

The OWEN BUCKET CO.

6050 BREAKWATER AVE. CLEVELAND, OHIO

BRANCHES: New York ● Philadelphia ● Chicago ● Berkeley, Cal.

Index to Advertisers

Alloy Steel & Metals Co. 90
*American Cable Div. of American Chain & Cable Co., Inc. Inside Back Cover
*American Chain & Cable Co. Inside Back Cover
*American Pulverizer Co. 80
*American Steel & Wire Co. 19
Anchor Concrete Machy. Co. 73
Atlantic Equipment Corp. 92
Audubon Wire Cloth Corp. 74

*Barber-Greene Co. 2
Bacon, Inc., Earl C. 56
Bay City Shovels, Inc. 81
Birmingham Steel & Locomotive Co. 92
*Blaw-Knox 76
Bristol Company, The 87
Broadcast Section 90-96
Broderick & Bascom Rope Co. 6
*Brooks Equip. & Mfg. Co. 86
*Bucyrus-Erie Co. 17
*Bucyrus-Monighan Co. 17
*Buell Engineering Co., Inc. 5
Burnham, Royal E. 94

Chicago Perforating Co. 56
Chicago Steel Fdry. Co. 87
Cleveland Wire Cloth & Mfg. Co. . . . 89
Commercial Shearing & Stamping Co., The 76
Consolidated Products Co. 91
F. D. Cummer & Son Co., The. 75

*Deister Concentrator Co. 54
Deister Machine Co. 61
*Dempster Bros. 88
Dunn Mfg. Co., W. E. 77

*Eagle Iron Works 85
*Ensign-Bickford Co. 8
Equipment Corporation of America. 93
*Erie Steel Constr. Co. 74

Flexible Steel Lacing Co. 81
*Fuller Co. 4

Gates Rubber Co., The 3
Goodyear Tire & Rubber Co., The Back Cover
*Gruendler Crusher & Pulverizer Co. 64

*Haiss Mfg. Co., Geo. 22
Harnischfeger Corp. 60
Heltzel Steel Form & Iron Co. 74
*Hendrick Mfg. Co. 88
Hetherington & Berner, Inc. 96
Hoffman Bros. Drilling Co. 94
Hollostone Machine Co. 73
Hyman-Michaels Co. 93

Industrial Brownhoist Corp. 79

*Jaeger Machine Co. 57-59-66-67

Kansas City Hay Press Co. 90
*Kent Machine Co., The. 73
*Koehring Company 15

Lewis, Harry C. 95
Lewistown Foundry & Machine Co. 88
*Link-Belt Co. 1
Ludlow-Saylor Wire Co. 88

Manganese Steel Forge Co. 74
Marmon-Herrington Co., Inc. 53
McCarter Iron Works Inc., The. . . . 76
McLanahan & Stone Corp. 89
McLeod, Alex T. 95
*Merrick Scale Mfg. Co. 89
*Morris Machine Works 89
*Multiplex Concrete Machy. Co. . . . 75

National Powder Co. 57
National Wire Cloth, Inc. 89
Naylor Pipe Co. 62
New Holland Machine Co. 63
Nordberg Mfg. Co. 13

O'Neill, A. J. 90
Owen Bucket Co. 96

*Parson Engineering Corp. 87
Penn Electrical Engineering Co. . . . 91
Pennsylvania Drilling Co. 94

Quinn Wire & Iron Works 74

*Raymond Pulverizer Div. of Combustion Engr. Co., Inc. 20
Republic Rubber Div. of Lee Rubber and Tire Corp. 7
*Robins Conveying Belt Co. 80
*Roebling's Sons Co., John A. 55

Sanford-Day Iron Wks. 90
*Sauerman Bros., Inc. 86
Screen Equipment Co. 59
Simplicity System Co., The. 79
Smidth & Co., F. L. 11
Smith Engineering Works 9
*T. L. Smith Co., The 75
Southern Iron & Equipment Co. . . . 95
Sprout, Waldron & Co. 89
Stanhope, Inc., R. C. 95
Sterling Motors Corp. 79
Straub Mfg. Co. 85

Taylor Forge & Pipe Works 58
Timken Roller Bearing Co., The . . . 10
Traylor Engineering & Mfg. Co. . . . 83
Tyler Co., W. S. 62

United Hoisting Co., Inc. 95
*United States Steel 19
*Universal Concrete Pipe Co. 73
*Universal Crusher Co. 14
Unverzagt, G. A. 95

Wall Rope Works, Inc. Inside Front Cover
Walsh Co., R. P. 93
*Warren Bros. Roads Co. 88
Wellman Engineering Co., The. . . . 83
*Williams Patent Crusher & Pulverizer Co. 89
Winternitz & Co., Samuel L. 91

Zagelmeyer Cast Stone Block Machy. Co. 74

***See also Information in the 1939 Pit and Quarry HANDBOOK**

COMPLETE HYDRAULIC DREDGES

SAND AND GRAVEL DREDGING PUMPS
AGITATING MACHINERY
DREDGE HOISTS
STEEL HULLS • PONTOONS
PIPE LINE ACCESSORIES

HETHERINGTON & BERNER, INC.
701-745 KENTUCKY AVENUE .. .. INDIANAPOLIS, IND.

TRU-LAY *Preformed* MAKES HARD WORK EASIER

These jobs are hard work any way you look at it. TRU-LAY Preformed Wire Rope makes this hard work easier regardless of application. So many operators have found this to be true that today TRU-LAY Preformed has become the standard of excellence for all industry.

TRU-LAY Preformed has many distinctive characteristics. It is limber, flexible, easy to handle. It resists kinking. It endures the fatigue of small diameter sheaves longer. It is the ideal running rope. It is a safer rope to handle. More than this, TRU-LAY Preformed lasts much longer. All American Cable Wire Ropes made of Improved Plow Steel are Identified by the Emerald Strand.

BUY ACCO QUALITY

whether for American Cable Lines—American Welded Chains—Page Welding Wire—Ford Chain Blocks—or any other of the 137 ACCO Quality Products.

Send today for this constructive helpful booklet. No obligation.

AMERICAN CABLE DIVISION

WILKES-BARRE, PENNSYLVANIA

District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

GREEN SIGNIFIES SAFETY

AMERICAN CHAIN & CABLE COMPANY, Inc.

AMERICAN CHAIN DIVISION • AMERICAN CABLE DIVISION • ANDREW C. CAMPBELL DIVISION • FORD CHAIN BLOCK DIVISION • HAZARD WIRE ROPE DIVISION • HIGHLAND IRON AND STEEL DIVISION • MANLEY MANUFACTURING DIVISION • OWEN SILENT SPRING COMPANY, INC. • PAGE STEEL AND WIRE DIVISION • READING-PRATT & CADY DIVISION • READING STEEL CASTING DIVISION • WRIGHT MANUFACTURING DIVISION • IN CANADA: DOMINION CHAIN COMPANY, LTD. • IN ENGLAND: BRITISH WIRE PRODUCTS, LTD. • THE PARSONS CHAIN COMPANY, LTD. • *In Business for Your Safety*

SIX months was the maximum service the Chas. England Gravel Company, Plainville, Indiana, had ever obtained from suction hose used to couple their dredge pump line. The combination of abrasion and severe twisting in this particular operation was just too much for the hose they were using.

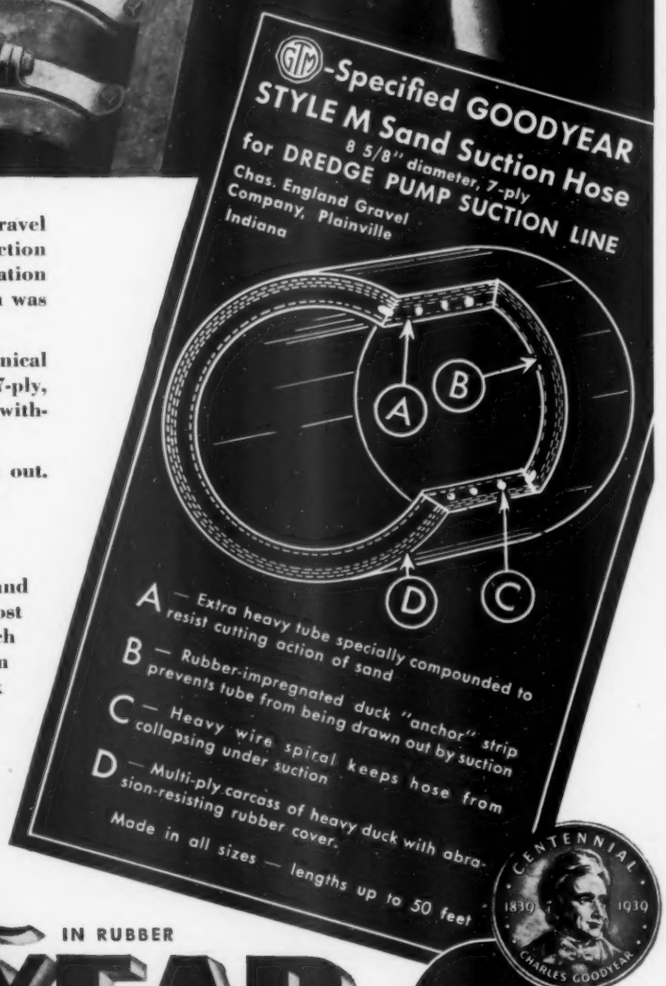
Then on recommendation of the G. T. M.—Goodyear Technical Man—a length of Goodyear Style M Sand Suction Hose, 7-ply, was installed on trial. Six months went by, a year, two years without any sign of failure.

Finally, at just a trifle under three years' service, it gave out. Needless to say, it was replaced with another Goodyear.

Specify Goodyear and Save

The Goodyear Style M cost no more than the former hose and it lasted nearly *six* times longer—an 83% saving in hose cost with no lost time for replacements every few months. Such economical performance is typical of the service you get from all Goodyear products built for the sand, gravel and rock industries—air and water hose, dredging sleeves, conveyor and transmission belts.

That's why it pays to consult the G. T. M.—you can do it better with Goodyear rubber. To bring this friendly consultant to your plant, write Goodyear, Akron, Ohio, or Los Angeles, California—or phone the nearest Goodyear Mechanical Rubber Goods Distributor.


GTM-Specified GOODYEAR
STYLE M Sand Suction Hose
8 5/8" diameter, 7-ply
for DREDGE PUMP SUCTION LINE
Chas. England Gravel Company, Plainville Indiana
A
B
C
D
A — Extra heavy tube specially compounded to resist cutting action of sand
B — Rubber-impregnated duck "anchor" strip prevents tube from being drawn out by suction
C — Heavy wire spiral keeps hose from collapsing under suction
D — Multi-ply carcass of heavy duck with abrasion-resisting rubber cover.
Made in all sizes — lengths up to 50 feet

CENTENNIAL OF CHARLES GOODYEAR'S DISCOVERY OF VULCANIZATION

THE GREATEST NAME IN RUBBER

GOODYEAR

BELTS • HOSE • MOLDED GOODS • PACKING